

Minnesota Department of Transportation Agreement Number: 73807P

Minnesota Intelligent Transportation Systems

Statewide Intelligent Transportation Systems As-Is Agency Reports for Minnesota



Volume 8 Miscellaneous

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Statewide ITS As-Is Agency Report for Minnesota

Volume 8

Miscellaneous

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- 1.2 Mn/DOT Advanced Portable Traffic Management System
- 1.3 Mn/DOT Portable Traffic Management System
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**Statewide ITS As-Is Agency Report for Minnesota
Volume 8
Miscellaneous**

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1. INTRODUCTION

The purpose of the Polaris Project is to define an Intelligent Transportation Systems (ITS) architecture for the state of Minnesota. An architecture is a framework that defines a complex system, in terms of a set of smaller, more manageable systems which are fully defined in terms of their individual boundaries, functions, physical components, and interfaces. They illustrate how each of the systems interrelate and contribute to the overall ITS objectives and requirements.

A well defined architecture provides many benefits for a complex system. It defines and optimizes the location of system functions. It identifies critical interfaces, and illustrates how associated systems can be integrated to share resources and information. It establishes standards for communications and physical components so that inter-operability can be maintained as the system evolves to incorporate new capabilities and technologies.

The Minnesota Statewide ITS Architecture is a tailored version of the National ITS Architecture. Tailoring incorporates the prioritized wants and needs of the state's transportation users and stakeholders, as well as its existing ITS infrastructure. The functional architecture, physical architecture, system requirements and implementation plan are fully documented in the following project deliverables:

ITS Traveler Wants/ Needs - Information obtained from Minnesota residents in ten end user sessions held across the state. Used to establish and prioritize end-user requirements.

ITS Transportation Wants/ Needs - Information obtained from ITS stakeholder institutions. Used to establish and prioritize ITS service provider requirements.

ITS Wants/ Needs Analysis - Final results and recommendations of the wants and needs research.

Statewide ITS As-Is Agency Reports for Minnesota - Information about existing transportation systems that establish the starting point for the Architecture Implementation Plan.

ITS System Specification - Incorporates the results of the functional and physical architectures into specification format. The specification will clearly identify ITS system level requirements for the identified Minnesota ITS services.

ITS Component Specification - Incorporates the results of the functional to physical allocation in specification format. The specification will clearly identify the Minnesota ITS component systems requirements.

ITS Architecture Implementation Plan - A recommended ITS deployment strategy for future state initiatives.

2. SCOPE

This document, *Statewide ITS As-Is Agency Reports for Minnesota*, consists of a collection of individual system survey reports related to transportation systems. The Polaris Project will use the survey information collected to derive the existing architectural framework. After the existing architectural framework is derived, this information will be used as the baseline for developing the Minnesota Statewide ITS Architecture.

Agencies identified and contributed to this document were:

- Minnesota Department of Transportation Office of Advanced Transportation Systems
- Minnesota Department of Transportation Traffic Management Center
- Minnesota Department of Transportation Metropolitan Division
- Minnesota Department of Transportation Electrical Services Section
- St. Paul Department of Public Works
- Minneapolis Department of Public Works
- Hennepin County Department of Public Works
- Ramsey County Department of Public Works
- Minnesota State Patrol
- Hennepin County Medical Center
- Metropolitan Council Transit Operations
- Metropolitan Airports Commission
- Gopher State One Call
- Minnesota Office of Tourism

2.1 Document Overview

This document presents the methods, assumptions and procedures used to collect the baseline information. The documentation of systems that were inventoried is presented in Section 3.

2.2 Methods, Assumptions, and Procedures

2.2.1 System Identification

Agency and system candidates were based upon several factors prior to survey. Through market research, the highest wants and needs priorities for traveler and transportation related agencies identified the functional areas to be improved (i.e. Travel Conditions). The Polaris Project took the functional wants and needs and associated the wants and needs functions to current Minnesota Agencies. Another factor that contributed to identifying the candidate agencies was the presence of existing Intelligent Transportation Systems infrastructure that has been deployed to support integrating open systems for travelers, inter-agency and intra-agency needs.

One hundred twenty one pre-survey candidate systems identified by the process described previously, are listed in Appendix A. The pre-survey candidate list represents systems that were known by members of the Polaris Architecture working team, Mn/DOT Guidestar, and SRF Consulting Group, Inc. Of the 121 candidate systems, 38 system surveys were performed and

included in this document. The 38 systems were selected as best representatives of the 121 pre-survey candidates and provided a diverse base of information to use for developing the Minnesota Statewide ITS Architecture.

2.2.2 Data Collection Guide

The survey of systems required that a standard data collection approach be applied for the *Statewide ITS As-Is Agency Reports for Minnesota*. A data collection guide was prepared to help this effort.

The data collection guide was developed to provide interviewers with an overview of relevant information that needed to be collected during the survey for each system. The data collection effort focused on the following:

- A block diagram of the system and interfaces to external users and systems.
- All hardware elements that are interconnected to form the bounds of the system.
- All software components used by the hardware elements.
- All system interfaces that connect hardware components together and external systems to the system.
- All personnel using the system.

The Data Collection Guide is presented in Appendix B.

2.2.3 Field Data Collection

The survey collection activities were completed by two teams of interviewers. Prior to an on-site interview, an agency or system contact person was briefed as to the nature of the survey. In some cases, generally where agencies knew little of the Polaris project, a follow-up letter was sent to further outline the desired level of information.

The on-site interview was generally a free format discussion of the specific system elements. The data collection guide was only used to ensure all components were discussed. The interviewers recorded the audio portion of the interview in order to help with the documentation of the system. Where possible, the actual system components were also recorded on videotape, again, to help with the system documentation. In some cases, written documentation from the agency was reviewed to help describe the system.

A report of the surveyed system followed a standard format and consisted of two basic parts: 1) a system block diagram and 2) a data collection template. The block diagram is intended to depict the system components and interfaces while the template thoroughly describes the system configuration. The template is organized to step through the system related personnel, hardware, software and interfaces. All systems documented for the project used this standardized approach. The system documentation was separated by agencies into eight volumes.

The system reports contained in this volume follow in Section 3.

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3. AS-IS BASELINE SYSTEM DOCUMENTATION

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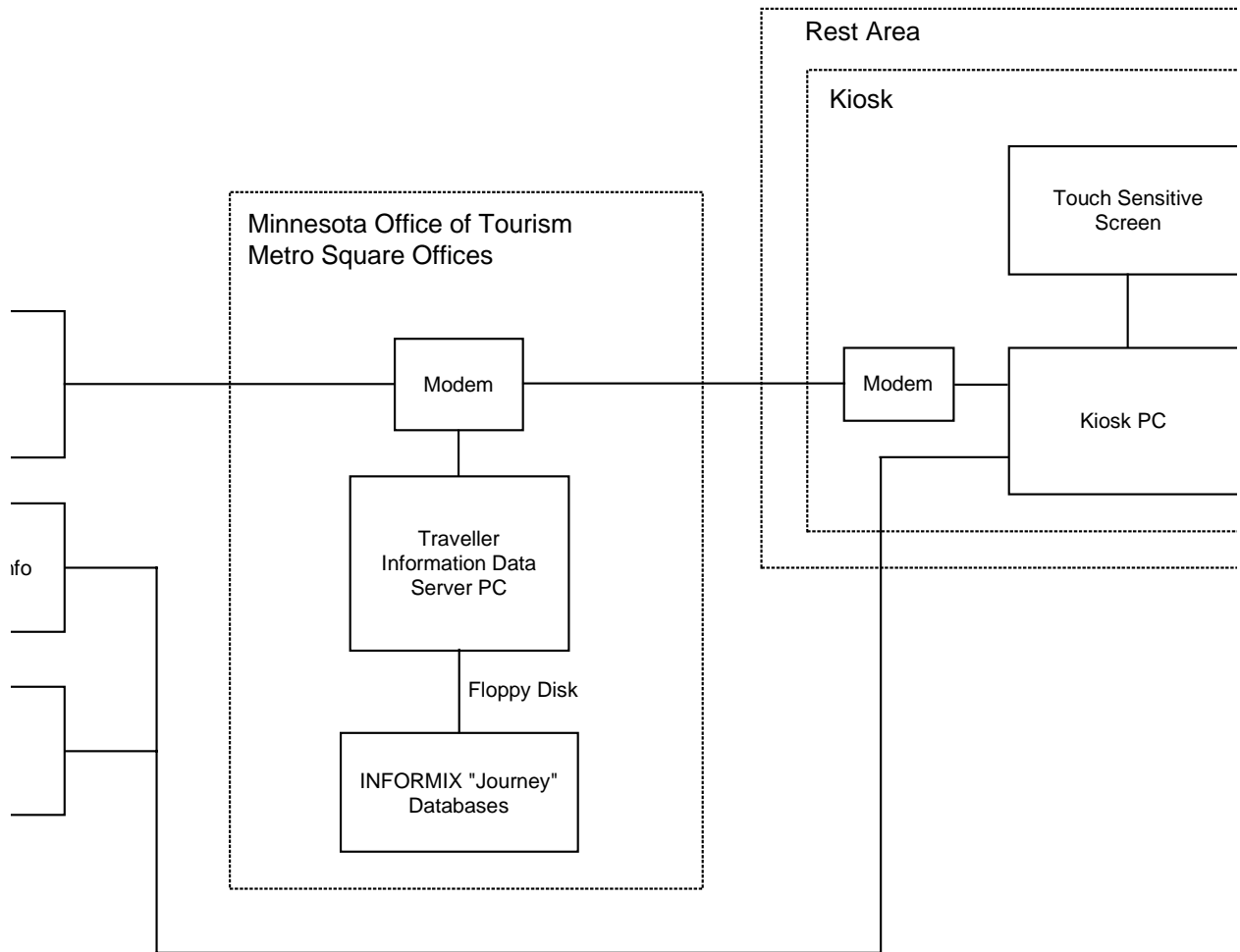
3.8 MISCELLANEOUS

- 3.8.1 Minnesota Travel Partners Kiosk System
- 3.8.2 Mn/DOT Pavement Condition and Weather Reporting System
- 3.8.3 Hennepin County Medical Center Emergency
Vehicle Dispatch System
- 3.8.4 Metropolitan Airports Commission Parking Management and
AVI System
- 3.8.5 Gopher State One-Call Excavation Notification System
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- 3.8.7 Hennepin County Construction Information System
- 3.8.8 Ramsey County Construction Information System
- 3.8.9 Mn/DOT ESS Gopher State One-Call Access System

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3.8.1 MINNESOTA TRAVEL PARTNERS KIOSK SYSTEM

Baseline Data Collection
Travel Partners Kiosk System



AS-IS DATA COLLECTION TEMPLATE

1.0 AGENCY AMINNESOTA OFFICE OF TOURISM@

- Agency Type State office; part of the Department of Trade and Economic Development.
- Agency Functions Tourism / Travel promotion.
- Agency Location(s) 100 Metro Square
121 7th Place East
St. Paul, MN 55101-2112
- Contacts Richard Haskett - Assistant Director of Tourism
Customer Services
(612) 296-5027 (voice) (612) 296-2800 (fax)

2.0 SYSTEM AMINNESOTA TRAVEL PARTNERS KIOSK SYSTEM@

- Date of As-Is Data Collection February 29, 1996
- Purpose Minnesota Travel Partners is a partnership between the Office of Tourism and the Minnesota Department of Transportation.
The system provides several types of data to motorists at roadside rest facilities through interactive kiosks (For description of data see hardware section).
- Hours of Operation 24 hrs/day
- Geographic Coverage One Kiosk at Duluth (Thompson Hill Rest Area) and 1 at St. Cloud Rest Area. Also one Portable kiosk.
- Status Existing
- Policies This system uses databases maintained by the Office of Tourism. In the future, it may be possible for businesses in the database to provide more promotional copy for distribution on the system for a fee.
- Recommended Improvements Office of Tourism plans to add another fixed kiosk at the Dresbach rest area when funds are available.
- Block Diagram See attached
- Typical Operational Scenario A motorist stops at one of the equipped rest areas and touches the kiosk screen to start the program. The motorist can then choose from amongst several types of information which include:
Current weather conditions, which are provided by a outside vendor.
1) A route planning utility which can create a route map to the motorists destination
2) A database of information relating to accommodations, attractions and special events.
3) A multimedia display of attractions (this display has severe limitations on information updates).

2.1 PERSONNEL ACLERK@

- Personnel Function Carries floppy disks containing the traveler information database from the Informix database server to the data server PC. Clerk is responsible for updating the database for the Traveler Information system
- Quantity 1
- Location Metro Square Offices
- Workload This function is a minor part of Clerk-s responsibilities
- Status Existing

2.2 PERSONNEL AOFFICE OF TOURISM STAFF@

- Personnel Function Conducts surveys to determine locations of facilities and attractions
Updates Informix database

3.1 HARDWARE AMODEM@

- Hardware Type Dial-up serial communications device
- Functions Sends data to kiosk PC-s
- Location Metro Square Offices
- Data Name/Contents There are several types of data being sent and received.
Received Data:
1) Weather data service dials in at 15 minute intervals and downloads current weather info.
2) Kiosks download usage information (number of touches on a specific menu choice) on an as-needed basis.
Sent Data:
3) Weather data is sent to kiosks at 15 minute intervals.
4) Updates to the Accommodations/ Events/ Attractions databases located at the kiosks are done an as-needed basis.
- Data Type Data
- Status Existing

3.2 HARDWARE ADATA SERVER PC@

- Hardware Type Intel - based
- Functions Receives and processes incoming data from weather info service and usage data from kiosks. Stores and sends data for database updates to kiosk databases.
- Location Metro Square Offices
- Data Name/Contents See HARDWARE 3.1
- Data Type Data
- Status Existing
- Contact Richard Haskett (see above)

3.2.1 SOFTWARE ADOS/WINDOWS@

- Software Type Operating system

3.2.2 SOFTWARE AINFORMIX@

- Software Type Database Manager
- Functions Stores and manages data, dials up and communicates with Informix databases at local kiosks
- Status Existing

3.3 HARDWARE AMODEM@

- Hardware Type Dial-up serial communications device
- Functions Sends and receives data
- Location At kiosk
- Data Name/Contents Received Data:
 - 1) Current weather is updated at 15 minute intervals.
 - 2) Accommodation/ Events/ Attractions database is updated on an as-needed basis.Sent Data:
 - 3) Usage data is sent to the Data Server PC at the Metro Square location.
- Data Type Data
- Status Existing
- Issues The updates to the kiosk Accommodations/ Events/ Attractions database currently require approximately three hours per kiosk to complete. It was not clear during the interview if this was a software limitation or a connection speed limitation.
- Recommended Improvements The Office of Tourism is currently examining options for upgrading communications between the Metro Square Computer and the kiosks, but no firm plans or time lines have been set.

3.4 HARDWARE ATOUCH SENSITIVE DISPLAY@

- Hardware Type Color display and input device
- Functions Displays menus, maps, graphics, video, audio and text information to users. Also functions as the device by which the user makes selections.
- Location At kiosk
- Data Name/Contents The displayed information can be any combination of information from the in-kiosk database, the weather information, or the in-kiosk mapping utility.
- Data Type Text/Graphics (in some cases photographs and video)
- Status Existing
- Recommended Improvements The Office of Tourism is examining the possibility of using mechanical keypads in place of touch sensitive screens in any future installations

3.5 HARDWARE AKIOSK PC@

- Hardware Type Intel-based PC
- Functions
 - 1) Stores database info.
 - 2) Processes data requests from users
 - 3) Creates usage statistics
 - 4) Communicates with Data Server PC at Metro Square Offices
- Location At kiosk
- Data Name/Contents Several types of data are stored and processed by this computer:
 - 1) The Accommodations/ Attractions/ Events database is stored on each kiosk. Users can perform a variety of queries on this database.
 - 2) There is a mapping facility which allows the user to select from 75 destinations in Minnesota. The software will provide a map and directions to the selected destination.
 - 3) Weather information (i.e. temp, sky and precipitation conditions) is accessible through the kiosk.
 - 4) There is also a multimedia database of attractions which is not updatable remotely.
- Data Type Text/Graphics/Data
- Status Existing
- Issues
 - 1) The mapping facility cannot provide directions outside of the 75 preprogrammed locations, and generally operates on a city-to-city level, not giving specific local street directions.
 - 2) The Office of Tourism has not been satisfied with the multimedia component of the system, as its content is hard-coded in the application software and cannot be changed by anyone other than the developer or a programmer.
- Recommended Improvements The Office of Tourism is currently examining options for replacing both the mapping utility and the multimedia attractions database. Desired functionality would include:
 - 1) Allowing users to specify any destination and supplying them with both a map and text directions to any point on any road in the state.
 - 2) Allowing staff members to update the content of the multimedia database.

3.6 HARDWARE AINFORMIX DATABASE SERVER PC@

- Hardware Type Intel Based PC
- Functions Stores the Alive@ copy of the Accommodations/
Attraction/ Events database which is accessible through
the AJOURNEY@ Travel Planning System
- Location Metro Square Offices
- Data Name/Contents See attached survey form
- Data Type Data
- Status Existing

3.6.1 SOFTWARE ADOS/WINDOWS@

- Software Type Operating System

3.6.2 SOFTWARE AINFORMIX@

- Software Type Database manager

4.1 INTERFACE Weather Information Service

- Connects to ... Modem In Data Server PC
- Interface Type Data
- Interface Direction Output
- Interface Component Voice grade telephone line (US West)
- Information Type/Content Current weather Information.
- Information Direction Output
- Information Frequency 15 minute intervals

4.2 INTERFACE Data server modem

- Connects to ... Kiosk modem
- Interface Type Data
- Interface Direction Both
- Interface Component Voice grade telephone line (US West)

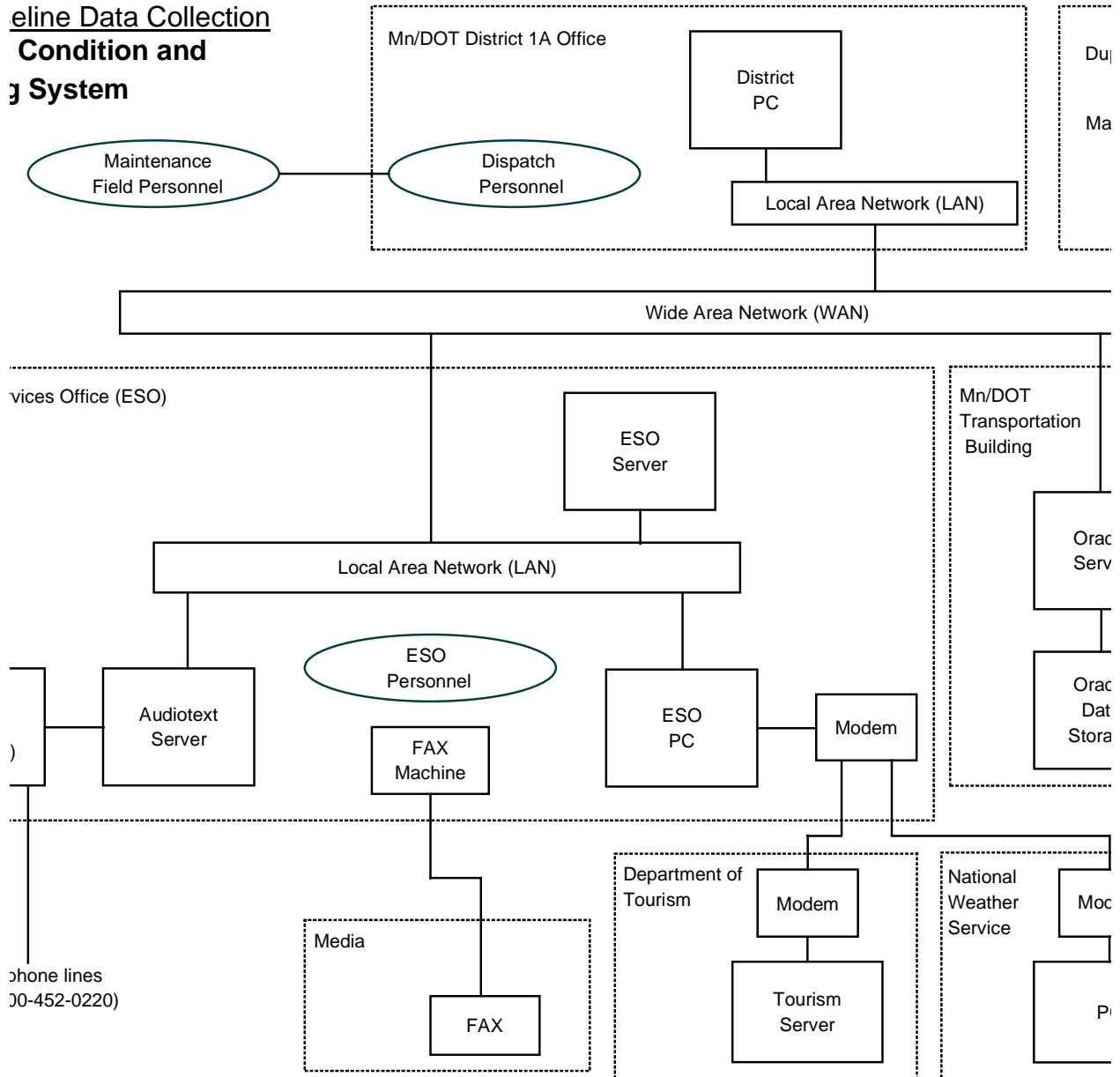
| | | |
|----------------------------|-----------|--|
| 4.3 | INTERFACE | Kiosk PC |
| - Connects to ... | | Touch sensitive display |
| - Interface location | | In kiosk |
| - Interface Type | | Data and video graphics |
| - Interface Direction | | Both |
| - Interface Component | | VGA Cable + other unknown component, possibly serial RS-232 |
| - Information Type/Content | | Information from database is displayed on screen. User input is detected and sent to kiosk PC |
| - Information Direction | | Both |
| - Information Frequency | | As Needed |
| - Other | | The Office of Tourism is considering using standard VGA displays and mechanical keypads in future installations, making this interface obsolete. |
| 4.4 | INTERFACE | INFORMIX DATABASE SERVER PC |
| - Connects to ... | | Data server PC |
| - Interface location | | Metro Square Offices |
| - Interface Type | | Data |
| - Interface Direction | | Output |
| - Interface Component | | Diskette carried from INFORMIX Server to Traveller Information Server |
| - Protocol/Standard | | N/A |
| - Information Type/Content | | Changed records in the Accommodations/ Attractions/ Events Database |
| - Information Direction | | Output |
| - Information Frequency | | As Needed |
| - Information Standards | | INFORMIX Table |

4.5 INTERFACE

| | |
|----------------------------|--|
| - Connects to ... | Site Specific Info/ Attractions Multimedia Database Kiosk PC |
| - Interface location | At Kiosk |
| - Interface Type | Data |
| - Interface Direction | Output |
| - Interface Component | These types of data are either carried to the kiosk PC on floppy diskettes or they are hand-keyed at the site. |
| - Protocol/Standard | N/A |
| - Information Type/Content | Site Specific Info: 1) Nearest Tow Service 2) Nearest Hospital 3) Nearest Gas Station 4) Nearest Restaurant 5) Emergency Service Info Multimedia Database: Photographs & Digital Audio/Video of major attractions in the area |
| - Information Direction | Output |
| - Information Frequency | 1) Site specific Info is keyed at the time the kiosk becomes active and can be updated as needed. 2) Multimedia attractions info is installed at the time software is loaded onto the PC. Afterward it can only be updated by the developer. |

3.8.2 MN/DOT PAVEMENT CONDITION AND WEATHER REPORTING SYSTEM

**eline Data Collection
Condition and
g System**



AS-IS DATA COLLECTION TEMPLATE

1.0 AGENCY AMN/DOT EMERGENCY SERVICES OFFICE@

- Agency Type Emergency Services Office
- Agency Functions Provide weather and construction information
- Agency Location(s) 100 Stockyards Road
South St. Paul, MN 55075
- Contacts Darrel L. Schierman

2.0 SYSTEM AMN/DOT PAVEMENT CONDITION AND WEATHER REPORTING@

- Date of As-Is Data Collection 2-12-96
- Purpose Provide statewide pavement condition and weather information to all Mn/Dot Districts and the general public.
- Hours of Operation 24 hours a day - November 1 to May 1
- Geographic Coverage System covers all interstate, trunk highway and scenic routes in the state.
- Contacts Darrel L. Schierman - Director
Road and Vehicle Information and Service
Mail Stop 415, Room 152
100 Stockyards Road
South St. Paul, MN 55075
612-552-7535 (voice)
612-297-1908 (fax)
612-640-2609 (pager)
- Status Existing
- Recommended Improvements A new road weather information system is being field tested and is expected to be implemented at all districts beginning in November 1996.
- Block Diagram See attached
- Typical Operational Scenario
 - 1) The maintenance field personnel uses either radio or cellular phone communication to the dispatch personnel and reports by exception any conditions other than good winter driving conditions. This process is identical in the new system.
 - 2) The dispatch personnel writes the information down for entry into the E-mail system. This step will be eliminated with the new system.
 - 3) The dispatch personnel uses the office vision E-mail system (PROFS) and inputs the information into a standardized screen. The dispatch personnel then broadcasts the information to the Emergency Services Office (ESO). The new system will use a Microsoft Access interface with a real time connection to the Oracle 7 database server. Through this connection all district

offices, maintenance facilities and truck centers will have instant access to update and review all data.

- 4) ESO personnel receive the information from all districts and produce a summary report. The summary report is then broadcast over the PROFS system to all district offices , maintenance facilities and truck centers. The new system will allow each district to view the data, therefore the ESO office will not have to broadcast the information back to each district, maintenance facility or truck centers. The new system database will be used to create graphic representation of the weather conditions on state and region maps using ESRI ArcView.
- 5) Information is put on the audio text server for access by the general public using the telephone.
- 6) The ESO also faxes the summary report to the media.
- 7) The information is also uploaded to the Department of Tourism server and the National Weather Service.

2.1 PERSONNEL ADIRECTOR@

- Personnel Function Oversee operation of road weather information system
- Quantity 1
- Location Emergency Services Office - Truck center
Mail Stop 415, Room 152
100 Stockyards Road
South St. Paul, MN 55075
- Working Hours Normal business hours
- Status Existing
- Contact Darrel L. Schierman

2.2 PERSONNEL ATECHNICIAN/SUPERVISOR@

- Personnel Function 1) Summarize information from all districts.
2) Input information into the audio text server.
3) Fax information to media.
4) Upload information to the Department of Tourism server and National Weather System computer.
5) Oversee seasonal employees
- Quantity 1
- Location Truck Center
- Working Hours Normal business hours
- Status Existing

2.3 PERSONNEL ASEASONAL EMPLOYEE@

- Personnel Function 1) Summarize information from all districts.
2) Input information into the audio text server.
3) Fax information to media.
4) Upload information to the Department of Tourism server and National Weather System computer.
- Quantity 4
- Location Truck Center
- Workload The system is operated and updated 7 days a week and 24 hours a day from November 1 to May 1. These employees work the evening and weekend shifts during this period.
- Working Hours Variable
- Status Existing

2.4 PERSONNEL ADISPATCH PERSONNEL@

- Personnel Function Monitor communication with maintenance personnel and enter information into the database
- Quantity 1
- Location District office dispatch center
- Working Hours 24 hours per day
- Status Existing

2.5 PERSONNEL AMAINTENANCE FIELD PERSONNEL@

- Personnel Function Communicate road weather information to the dispatch personnel from maintenance vehicle.
- Quantity Unknown
- Location In field
- Workload Variable
- Working Hours Variable
- Status Existing

3.1 HARDWARE ADISTRICT PC@

- Hardware Type Personal computer
- Functions
 - (1) Runs office vision (PROFS)
 - (2) Runs Microsoft Access software
 - (3) Other office functions
- Location District office dispatch center
- Data Name/Contents
 - Pavement condition data entered by the dispatch personnel.
 - Existing system data:
Although there is a standard screen for data input, the terminology and completeness of information was not always consistent. The new system was developed based on the existing system, but uses standardize terminology.
 - New system data includes:
 - MN/DOT District
 - Roadway type, segment, mile post end and start
 - Visibility (clear, 2 mile, 1/4 mile, less than 1000 feet, or zero)
 - Condition (dry, wet, frost, glazed ice, slush, snow, compaction or narrow cuts)
 - Precipitation (None, rain, drizzle, sleet, snow or fog)
 - Indicator (N/A, light, moderate, heavy or freezing)
 - Maintenance operation (None, plowing, sanding-salting, plowing-sanding-salting, blading or clean-up)
 - Traffic speed (posted, less than posted, slow or stop and go)
 - General condition (GWDC-good winter driving conditions, FWDC-fair, PWDC-poor, S. Spots-slippery spots, NTA-no travel advised or closed
- Data Type Data
- Status Existing
- Other 386 or 486 (if upgraded) PC

3.1.1 SOFTWARE AOFFICE VISION (PROFS)@

- Software Type Data interchange
- Software Standards Electronic mail
- Functions Allows user to send and receive information from any MN/DOT office or facility.
- Status Existing

3.1.2 SOFTWARE AMN/DOT PAVEMENT CONDITION REPORTING SYSTEM@

- Software Type Database
- Software Standards Microsoft Access (District version)
- Functions
 - (1) Opens direct connection to Oracle sever and database.
 - (2) User interface for pavement condition data entry.
 - (3) Prints reports of pavement condition conditions.
- Status New
- Contacts System designed and developed by:
Sufficient Systems, Inc.
2860 Patton Road
Roseville, MN 55113
(612) 638-9190 (voice)
(612) 638-9290 (fax)
Brad Wagner - Project Leader
Government Systems Division
bwagner@sufsys.com (E-mail)
<http://www.sufsys.com>

3.2 HARDWARE AEMERGENCY SERVICES OFFICE (ESO) PC@

- Hardware Type Personal computer
- Functions
 - (1) Runs office vision (PROFS)
 - (2) Runs Microsoft Access software
 - (3) Runs ESRI ArcView
 - (4) Runs Hijaak
 - (5) Runs Crosstalk for Windows
 - (6) Other office functions
- Location ESO office
- Data Name/Contents
 - Pavement condition data broadcast on PROFS system.
 - New system data includes:
 - MN/DOT District
 - Roadway type, segment, mile post end and start
 - Visibility (clear, 2 mile, 1/4 mile, less than 1000 feet, or zero)
 - Condition (dry, wet, frost, glazed ice, slush, snow, compaction or narrow cuts)
 - Precipitation (None, rain, drizzle, sleet, snow or fog)
 - Indicator (N/A, light, moderate, heavy or freezing)
 - Maintenance operation (None, plowing, sanding-salting, plowing-sanding-salting, blading or clean-up)
 - Traffic speed (posted, less than posted, slow or stop and go)
 - General condition (GWDC-good winter driving conditions, FWDC-fair, PWDC-poor, S. Spots-slippery spots, NTA-no travel advised or closed)
 - Graphical representation of road conditions on state and region maps. The maps will show road conditions and weather information on segment using color codes.
- Data Type Data
- Status Existing
- Other Compaq 486- 66 MHz

3.2.1 SOFTWARE AOFFICE VISION (PROFS)@

- Software Type Data interchange
- Software Standards Electronic mail
- Functions Allows user to send and receive information from any MN/DOT office or facility.
- Status Existing

3.2.2 SOFTWARE AMN/DOT PAVEMENT CONDITION REPORTING SYSTEM@

- Software Type Database
- Software Standards Microsoft Access (Administrator=s version)
- Functions
 - (1) Opens direct connection to Oracle sever and database.
 - (2) User interface for pavement condition data entry.
 - (3) Prints reports of pavement condition conditions.
 - (4) Allows administrator to modify operational aspects of the system. It will allow the administrator to add or modify the list of descriptive words for any category.
 - (5) Allows administrator to combine, divide or rename the road segments in the system.
 - (6) Access to ArcView application.
 - (7) Access to other applications for converting and transmitting map images.
- Status New
- Contacts System designed and developed by:
Sufficient Systems, Inc.
2860 Patton Road
Roseville, MN 55113
(612) 638-9190 (voice)
(612) 638-9290 (fax)
Brad Wagner - Project Leader
Government Systems Division
bwagner@sufsys.com (email)
<http://www.sufsys.com>

3.2.3 SOFTWARE AESRI ARCVIEW@

- Software Type Database
- Software Standards GIS
- Functions Accesses Oracle database to display road conditions on state or region maps.
- Status New

3.2.4 SOFTWARE AHJAAK@

- Software Type File compression utility
- Software Standards Other
- Functions This software will batch all image files into a single file for transmission to the Department of Tourism server.
- Status New

3.2.5 SOFTWARE ACROSSTALK for WINDOWS@

- Software Type Communications software
- Software Standards Other
- Functions Used to upload map images to the Department of Tourism server.
- Status New

3.3 HARDWARE AESO SERVER@

- Hardware Type PC
- Functions Stores
- Location ESO office
- Data Name/Contents 1) Pavement condition and weather reports
2) Base map images
- Data Type Data
- Status Existing

3.4 HARDWARE AAUDIOTEXT SERVER@

- Hardware Type PC
- Functions Stores
- Location ESO office
- Data Name/Contents Audiotext for dial-up phone line service
- Data Type Data
- Status Existing

3.5 HARDWARE ATELEPHONE SYSTEM@

- Hardware Type Telephone audiotext processor and telephone line selector.
- Functions Processes audiotext responses and controls telephone line off-hook, on-hook.
- Location ESO office
- Data Name/Contents Audiotext responses
- Data Type Digitized voice
- Status Existing
- Other Local access number - 296-3076
Toll free access number 1-800-452-0220
1) Touch tone menu
 - 1- North
 - 2- Central
 - 3- South
 - 4- Twin Cities metro area2) Total of 20 phone lines, one is used for administrative purposes and five 800 ready lines

3.6 HARDWARE AFAX MACHINE@

- Hardware Type Fax machine
- Functions Sends summary reports to media.
- Location ESO office
- Data Name/Contents Summary pavement conditions and weather information.
- Data Type Data
- Status Existing

3.7 HARDWARE AESO MODEM@

- Hardware Type Modem 28.8 baud
- Functions Uploads information to the Department of Tourism server and the National Weather Service
- Location ESO office
- Data Name/Contents Pavement conditions and weather information
- Data Type Data
- Status Existing

3.8 HARDWARE AESO SERVER@

- Hardware Type PC
- Functions Stores
- Location MN/DOT Transportation Building
- Data Name/Contents All MN/DOT electronic mail
- Data Type Data
- Status Existing

3.9 HARDWARE AORACLE SERVER@

- Hardware Type PC
- Functions Database for pavement condition and weather information
- Location MN/DOT Transportation Building
- Data Name/Contents All MN/DOT electronic mail
- Data Type Data
- Status Existing

3.9.1 SOFTWARE AORACLE DATABASE@

- Software Type Database
- Software Standards ODBC
- Functions Stores database of pavement condition and weather information..
- Status Existing
- Other Oracles NLM 7.1

3.10 HARDWARE ANATIONAL WEATHER SERVICE MODEM@

- Hardware Type Modem
- Functions Uploads information to the Department of Tourism server and the National Weather Service
- Location ESO office
- Data Name/Contents Pavement conditions and weather information
- Data Type Data
- Status Existing
- Other It was stated in the interview this modem was slow possibly 2400 baud.

3.11 HARDWARE ADEPARTMENT OF TOURISM@

See the documentation for the system: Minnesota Department of Tourism Information Center Kiosks

- 4.1 INTERFACE Maintenance field personnel
- Connects to ... Dispatch personnel
 - Interface location In field/district office
 - Interface Type Data
 - Interface Direction Both
 - Interface Component Cellular telephone and/or radio
 - Protocol/Standard None
 - Information Type/Content Pavement condition and weather information
 - Information Direction Both
 - Information Frequency As needed
 - Information Standards None

- 4.2 INTERFACE Local area network (LAN)
- Connects to ... Connect office computers
 - Interface location District office
 - Interface Type Data
 - Interface Direction Both
 - Interface Component Ethernet or token ring
 - Protocol/Standard Novell,TCP/IP, IPX
 - Information Type/Content Pavement condition and weather information
 - Information Direction Both
 - Information Frequency As needed
 - Information Standards See database structure

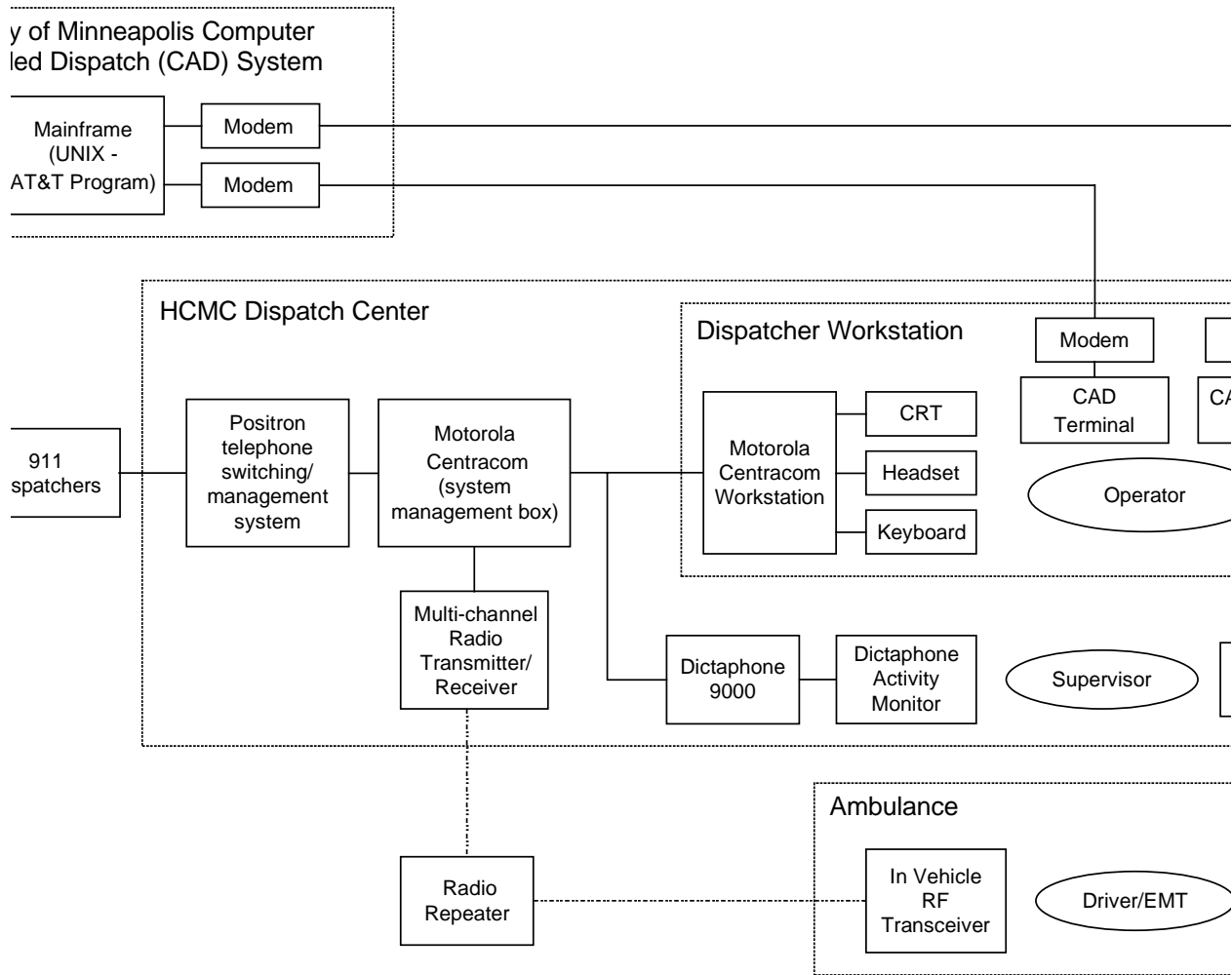
| | | |
|----------------------------|-----------|--|
| 4.3 | INTERFACE | Wide area network |
| - Connects to ... | | All Mn/DOT district offices, maintenance facilities and truck centers |
| - Interface location | | Transportation Building in St. Paul |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | T1 phone line (leased continuous operation at 1.544 Megabits per second with 768Kbps dedicated to data transfer at most locations) |
| - Protocol/Standard | | Novell, TCP/IP, IPX |
| - Information Type/Content | | Pavement condition and weather information |
| - Information Direction | | Both |
| - Information Frequency | | As needed |
| - Information Standards | | See database structure |
| 4.4 | INTERFACE | Audiotext server |
| - Connects to ... | | Telephone system |
| - Interface location | | ESO office |
| - Interface Direction | | Both |
| - Information Type/Content | | Audiotext messages |
| - Information Direction | | Output |
| - Information Frequency | | As needed |
| 4.5 | INTERFACE | ESO fax machine |
| - Connects to ... | | Media fax machine |
| - Interface location | | ESO office/Media office |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Service provider |
| - Information Type/Content | | Pavement condition and weather information |
| - Information Direction | | Output |
| - Information Frequency | | As needed |

| | | |
|----------------------------|-----------|--|
| 4.6 | INTERFACE | ESO Modem |
| - Connects to ... | | Department of Tourism modem and National Weather Service modem |
| - Interface location | | ESO office, Department of Tourism and National Weather Service |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Modem via service provider |
| - Information Type/Content | | Pavement condition and weather information |
| - Information Direction | | Output |
| - Information Frequency | | As needed |

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3.8.3 HENNEPIN COUNTY MEDICAL CENTER EMERGENCY VEHICLE DISPATCH SYSTEM

s Baseline Data Collection
nty Medical Center Emergency Vehicle Dispatch System



AS-IS DATA COLLECTION TEMPLATE

1.0 AGENCY AHENNEPIN COUNTY MEDICAL CENTER@

- Agency Location(s) Hennepin County Medical Center
600 Park Avenue South
Minneapolis, MN 55415

2.0 SYSTEM AEMERGENCY VEHICLE DISPATCH SYSTEM@

- Date of As-Is Data Collection 2/27/96
- Purpose Receive requests for emergency services from Minneapolis Computer Aided Dispatch (CAD) system, seven 911 dispatch services or direct calls out from private parties. Then dispatch ambulances as needed.
- Hours of Operation 24 hrs/day
- Geographic Coverage Two-thirds of Hennepin county, but will dispatch (mutual aid) ambulances to nearby communities if needed.
- Contacts Clif Giese
Supervisor, Ambulance Services
(612) 347-3427
- Status Existing
- Typical Operational Scenario There are three basic operational scenarios which differ primarily in the origin of the incoming call. A call is made to a 911 dispatch center, the dispatch center determines if the call should be responded to by Hennepin County Medical Center. The 911 dispatcher either keys the information in to HCMC-s system if so equipped or uses an auto-dial telephone system to contact an HCMC dispatcher. The Computer Aided Dispatch (CAD) system aids the dispatcher in determining the nearest ambulance based on the address of the caller and the locations of assigned ambulance stations. The Dispatcher/Operator at HCMC then uses the Motorola Centracom system to select a radio channel and Minn Comm.. paging to notify ambulance and issue instructions to the appropriate ambulance. The ambulance reports its status (i.e. en route, at station, etc.) back to the dispatcher who keys in the information. The Minneapolis 911 operator may key information directly into the CAD system which aids in selecting the nearest ambulance. From this point the process is identical to the first scenario.
In certain cases, such as at a nursing home or private call, the call may come directly to the HCMC dispatch center. In this case the process is identical to a call from a 911 dispatcher who does not have a direct connection to the

HCMC dispatch system.

For the calls that are received from the CAD system, the dispatcher punches a paper ticket in a mechanical device with the time of response to provide a hard copy record of operations.

2.1 PERSONNEL DISPATCH OPERATOR@

- Personnel Function Receives information from incoming calls and uses a radio-based voice dispatching system to send ambulances to requested locations.
- Quantity Three on duty at any given time
- Location HCMC dispatch facility.
- Workload Operation of the system is the sole function of the dispatchers
- Status Existing

2.2 PERSONNEL AEMT/PARAMEDIC@

- Personnel Function Operate ambulances and give emergency medical assistance
- Quantity Two in each ambulance

2.3 PERSONNEL ASUPERVISOR@

- Personnel Function Oversees the operation of the dispatch system
Provides data to other agencies
Manages personnel in the dispatch facility
- Quantity One
- Location HCMC dispatch facility

3.1 HARDWARE AMOTOROLA RADIO AND POSITRON TELEPHONE SYSTEM@

- Hardware Type Integrated radio and telephone communications system
- Functions Receive and routes incoming calls to dispatchers
Stores auto-dial numbers and allows access to Aoutside@ lines for dispatchers
Interfaces with Centracom consoles to provide access to the radio communication system.
- Location HCMC Skyway Level
- Data Name/Contents Incoming: voice descriptions of locations and conditions of medical emergencies on telephone system
Outgoing: voice descriptions of locations and conditions of medical emergencies as well as any special instruction for ambulances on radio system.
- Data Type Voice
- Status Existing

3.2 HARDWARE AMULTICHANNEL RADIO TRANSMITTER/RECEIVER@

- Hardware Type RF communications device
- Functions Communications with ambulances
- Location HCMC
- Data Name/Contents Dispatch information for ambulances, which includes:
 - 1) Location of emergency
 - 2) Nature of emergency
 - 3) Time check
- Data Type Voice

3.3 HARDWARE ADICTAPHONE 9000@

- Hardware Type Reel to reel, 60 track per reel, telephone and radio conversation recording device
- Functions Records all voice communication into and out of the HCMC dispatch facility. Tapes are archived for a period of one year.
- Location HCMC
- Data Name/Contents Any voice communication between the HCMC dispatch facility and other 911 dispatch facilities, direct call-ins, or any of the vehicles.
- Data Type Voice
- Status Existing

3.4 HARDWARE ADICTAPHONE ACTIVITY MONITOR@

- Hardware Type CRT with keypad
- Functions Displays status of Dictaphone 9000 recorder.
- Location Supervisor=s office at HCMC dispatch facility
- Data Name/Contents Recording status
Reel status
Fault/error messages
- Data Type Data
- Status Existing

3.5 HARDWARE AMOTOROLA CENTRACOM WORKSTATION@

- Hardware Type PC based - control hardware that allows Dispatchers/Operators to take telephone calls and access the radio communications system to dispatch vehicles.
- Functions Displays radio channel and telephone line status
Allows operator to select channels or lines
- Location At each dispatch workstation in the HCMC facility
- Data Name/Contents Centracom system status, status of telephone lines/radio channels. Proprietary commands to the CEBRUM system management hardware.
- Data Type Data

3.6 HARDWARE AINTERFACE HARDWARE@

- Hardware Type Color CRT Display
Earphone/microphone headset
Keyboard/mouse
- Functions Allows users to operate the Centracom hardware
- Location At each dispatcher workstation.

3.7 HARDWARE AMINNEAPOLIS CAD MAINFRAME@

- Hardware Type Mainframe Computer
- Functions Stores address data
Runs algorithms based on addresses to select closest emergency vehicle for dispatch
- Data Type Data
- Other AT&T program running in UNIX

3.8 HARDWARE AMODEM@

- Hardware Type Serial communications device.
- Functions Sends and receives data
- Location At the Minneapolis mainframe and one at each of the CAD terminals at the HCMC dispatch facility.
- Data Name/Contents CAD data flows to and from the CAD mainframe through the modems. This data includes:
 - ‡Nature of emergency
 - ‡Location (address) of emergency
 - ‡Nearest vehicle
 - Status of a vehicle (i.e. on station, en route, on scene, at hospital)
- Data Type Data
- Status Existing

3.9 HARDWARE ACOMPUTER AIDED DISPATCH (CAD) TERMINAL@

- Hardware Type Color/monochrome CRT and keyboard
- Functions Terminal provides access to Minneapolis CAD system. Access includes:
 - Ability to input address data for an emergency call.
 - ‡Automated ambulance selection for dispatch.
 - 3)‡Dispatcher updates of call status (i.e. en route, at location, at hospital)
- Location At each HCMC dispatch station
- Data Name/Contents Nature of emergency
Location (address) of emergency
Nearest vehicle
Status of an vehicle (i.e. on station, en route, on scene, at hospital)
- Data Type Data/text
- Status Existing

3.10 HARDWARE ACAD STATUS DISPLAY@

- Hardware Type Monochrome CRT
- Functions Displays current status of active vehicles responding to calls
- Location At each HCMC dispatch station
- Data Name/Contents Vehicle ID #
Destination address
Status (en route, at hospital, on scene)
Time current status became effective
- Data Type Data
- Status Existing

3.11 HARDWARE ATRUNK RADIO REPEATER@

- Hardware Type RF transceiver
- Functions Receives radio signal and rebroadcasts to achieve greater system range.
- Quantity Five to ten for each of five channels
- Location Various locations
- Data Name/Contents Pass through for dispatch communications (see HARDWARE 3.X)
- Data Type Voice

3.12 HARDWARE AIN-VEHICLE RADIO@

- Hardware Type Mobile RF Transceiver
- Functions Allows in-vehicle EMT-s to communicate with HCMC dispatchers.
- Location In each ambulance
- Data Name/Contents Receives location and nature of emergency information.
- Data Type Voice

3.13 HARDWARE ASUPERVISOR PC@

- Hardware Type IBM Personal computer
- Functions Create databases to export to county services.
- Location Supervisors office, HCMC dispatch facility
- Data Name/Contents Call ID, municipality, time call received, time call dispatched, time en route, time on scene, time going to hospital, time at hospital, time event cleared , and Nature of call.
- Data Type Data
- Status Existing

3.13.1 SOFTWARE AWINDOWS@

- Software Type Operating System
- Software Standards 32-bit
- Other Windows 95

3.13.2 SOFTWARE APARADOX@

- Software Type PC database manager
- Functions Accepts input from supervisor (manual re-key of CAD information) and creates Paradox-format tables to be sent to Hennepin County Community Health Department and internal department use.
- Status Existing

4.1 INTERFACE

- Callers
- Connects to ... Local 911 dispatcher or Minneapolis dispatcher
- Interface Type Voice
- Interface Direction Both
- Interface Component US West telephone line
- Information Type/Content ture of emergency
cation of emergency
- Information Direction Input
- Information Frequency When needed

4.2 INTERFACE

- 911 Dispatchers
- Connects to ... HCMC APositron@ telephone switching/management system
- Interface Type Voice
- Interface Direction Both
- Interface Component US West telephone line
- Information Type/Content Nature of emergency
Location of emergency
- Information Direction Both
- Information Frequency As needed

| | | |
|-----|----------------------------|---|
| 4.3 | INTERFACE | HCMC APositron® telephone switching/ management system |
| | - Connects to ... | Motorola Centracom ACEBRUM® system management hardware |
| | - Interface location | HCMC |
| | - Interface Type | Voice |
| | - Interface Direction | Both |
| | - Interface Component | Serial RS-232 |
| | - Information Type/Content | Emergency information being sent from a 911 dispatcher including: nature of emergency location (address) of emergency |
| | - Information Direction | Both |
| | - Information Frequency | As needed |
| 4.4 | INTERFACE | Motorola Centracom ACEBRUM® system management hardware |
| | - Connects to ... | Multichannel radio transmitter/receiver |
| | - Interface location | HCMC |
| | - Interface Type | Voice |
| | - Interface Direction | Both |
| | - Interface Component | Unknown |
| | - Information Type/Content | Location and nature of emergency information to be relayed to ambulances. Status reports from ambulances to dispatchers. |
| | - Information Direction | Both |
| | - Information Frequency | As needed |
| 4.5 | INTERFACE | Multichannel radio transmitter/receiver |
| | - Connects to ... | Trunk radio repeater |
| | - Interface location | Various locations within HCMC response area |
| | - Interface Type | Voice |
| | - Interface Direction | Both |
| | - Interface Component | 460 MHZ radio transmission |
| | - Information Type/Content | Location and nature of emergency information to be relayed to ambulances. Status reports from ambulances to dispatchers. |
| | - Information Direction | Both |
| | - Information Frequency | As needed |

- 4.6 INTERFACE Radio repeaters
- Connects to ... In vehicle RF transceiver
 - Interface Type Voice
 - Interface Direction Both
 - Interface Component 460 MHZ radio transmission
 - Information Type/Content Location and nature of emergency information to be relayed to ambulances.
Status reports from ambulances to dispatchers.
 - Information Direction Both
 - Information Frequency As needed
- 4.7 INTERFACE Motorola Centracom ACEBRUM® system management hardware
- Connects to ... Dictaphone 9000
 - Interface location HCMC
 - Interface Type Voice
 - Interface Direction Both
 - Interface Component Agency contact described Interface component as Aphone wire®. Component is probably twisted pair
 - Information Type/Content Any voice communication, regardless if its telephone or radio is passed over this interface to be recorded
 - Information Direction Output
 - Information Frequency Continuous
- 4.8 INTERFACE Dictaphone 9000
- Connects to ... Dictaphone activity monitor
 - Interface location HCMC dispatch facility
 - Interface Type Data
 - Interface Direction Output
 - Interface Component Unknown, but probably twisted pair
 - Information Type/Content Number of tracks being recorded
Time left on tape reel
Any error or fault information
 - Information Direction Output
 - Information Frequency Continuous

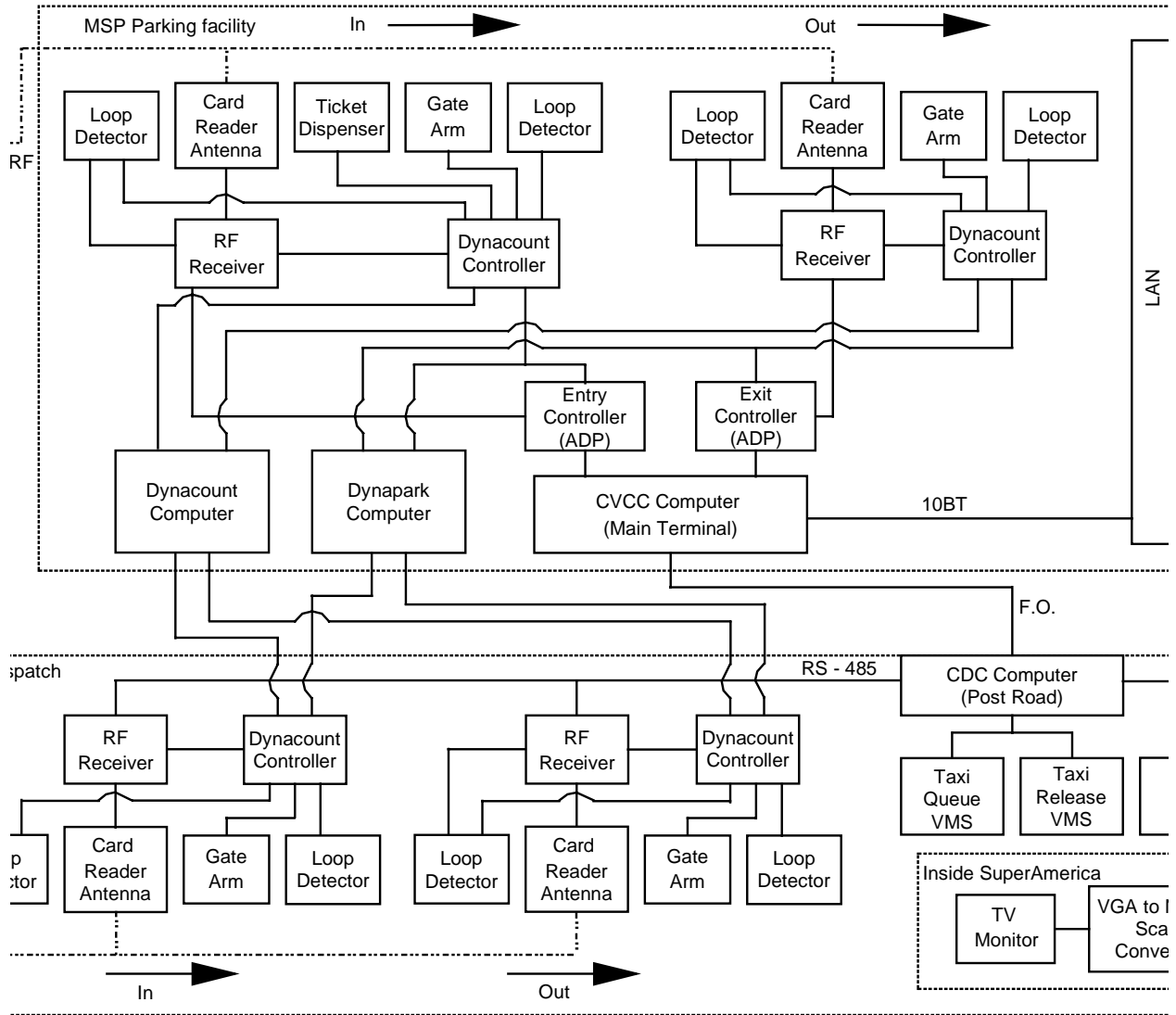
| | | |
|----------------------------|-----------|--|
| 4.9 | INTERFACE | Motorola Centracom ACEBRUM® system management hardware |
| - Connects to ... | | Motorola Centracom workstation |
| - Interface location | | HCMC |
| - Interface Type | | Data/Voice |
| - Interface Direction | | Both |
| - Interface Component | | Agency contact described Interface component as Aphone wire®. Component is probably twisted pair |
| - Information Type/Content | | From CEBRUM: 1) Voice on telephone system 2) Voice on radio system 3) Status of available telephone lines and radio channels From Centracom workstation: 1) Commands to select radio channels or telephone lines 2) Voice to be sent to telephone system 3) Voice to be broadcast over radio system |
| - Information Direction | | Output |
| - Information Frequency | | Continuous |
| 4.10 | INTERFACE | Motorola Centracom workstation |
| - Connects to ... | | Display CRT Headset Keyboard/Mouse |
| - Interface location | | At each dispatcher workstation at HCMC |
| - Interface Type | | Data/Voice |
| - Interface Direction | | Both |
| - Interface Component | | Proprietary wiring |

| | | |
|----------------------------|-----------|---|
| 4.11 | INTERFACE | Minneapolis computer CAD system mainframe |
| - Connects to ... | | Modem |
| - Interface location | | Minneapolis dispatch facility |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Information Type/Content | | CAD data flows to and from the CAD mainframe through these interfaces. This data includes: 1) Nature of emergency 2) Location (address) of emergency 3) Nearest vehicle 4) Status of a vehicle (i.e. on station, en route, on scene, at hospital) |
| - Information Direction | | Both |
| - Information Frequency | | As needed |
| 4.12 | INTERFACE | Modem (at Minneapolis CAD facility) |
| - Connects to ... | | Modem (at HCMC dispatch facility) |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Dedicated twisted pair |
| - Information Type/Content | | See Interface 4.11 |
| - Information Direction | | Both |
| - Information Frequency | | As needed |
| 4.13 | INTERFACE | Modem (at HCMC dispatch facility) |
| - Connects to ... | | CAD Terminal |
| - Interface location | | HCMC |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Serial RS-232 |
| - Information Type/Content | | See Interface 4.11 |
| - Information Direction | | Output |
| - Information Frequency | | Continuous |

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3.8.4 METROPOLITAN AIRPORTS COMMISSION PARKING MANAGEMENT AND AVI SYSTEM

Baseline Data Collection
 Metropolitan Airports Commission Parking Management and AVI System



AS-IS DATA COLLECTION TEMPLATE

1.0 AGENCY AMETROPOLITAN AIRPORTS COMMISSION@

- Agency Type Multi-jurisdictional air transportation facility planning and management commission
- Agency Functions Owns and operates airports in the metro area
- Agency Location(s) Minneapolis/St. Paul Airport (MSP)

2.0 SYSTEM APARKING MANAGEMENT AND AUTOMATIC VEHICLE IDENTIFICATION (AVI) SYSTEM@

- Date of As-Is Data Collection 3/18/96
- Purpose
 - 1) Control access of commercial vehicles to the MSP terminal
 - 2) Provide automated billing for usage fees
 - 3) Monitor parking space availability
 - 4) Automatically provides transportation to public based on demand
- Hours of Operation Continuous, 24 hours/day, seven days/week
- Geographic Coverage MSP terminal and nearby taxi dispatch facility
- Contacts Greg S. Leean
Manager, Landside Operations
Minneapolis/St. Paul International Airport.
4300 Glumack Drive
Suite 324, Center Mezzanine
St. Paul, MN 55111-3010
(612) 726-5244 (voice)
(612) 726-5527 (fax)
- Status Existing
- Block Diagram See attached
- Typical Operational Scenario The scenario described below contains information specific to taxis, other commercial vehicles are similar except for the dispatch functions.

The MSP terminal has a special entry for commercial vehicles (busses, shuttles and taxis) which use the pick-up and discharge passengers at the terminal.

1) This special entry is equipped with a radio transmitter/receiver which broadcasts a signal to a transponder located inside commercial vehicles called a Atag@.

2) Upon receiving the signal, the tag transmits a unique number to the system. The returned signal is processed by the system.

Operational Scenario (cont.)

3) A parking facility management system called

ADynacount®, which records that a vehicle has entered the parking facility using loop detectors.

4) The unique number is compared to a list of valid numbers in a centralized database to determine if the number is valid and if the vehicle can be admitted into the facility.

5) If the number is valid, a gate arm raises and the taxi can proceed to the dispatch queue.

6) The dispatch queue consist of a parking-type lane, a passenger waiting area, and a monitoring kiosk.

Passengers who wish to use a taxi can make special requests (i.e. station wagon, etc.)at the kiosk, in which a terminal connected to the dispatch system is located , otherwise they use one of the taxis already in the queue.

7) When the taxi leaves the airport, the tag is polled in a manner similar to the entry procedure. The vehicle is then recorded as having left the terminal.

8) After delivering the passenger, the taxi will return to a dispatch facility located at the Post Road Superamerica convenience store.

9) At the dispatch facility, the vehicle tag is read by RF equipment similar to that at the MSP terminal. The taxi then proceed to a parking lot where it waits for its assigned fender number to be displayed on a Variable Message Sign (VMS).

10) When the fender number is displayed, the taxi has five minutes to move into a queue to wait for release by having its number displayed on a second VMS. After a taxi is released, its tag is read by RF equipment as it leaves the dispatch facility.

11) The central AVI management computer at the MSP facility is informed that a taxi is en route. The taxi must arrive within a specified time or a time out occurs and the vehicle is invalid at the terminal.

12) When the taxi arrives at the MSP terminal, its tag is polled and the process begins again.

13) The AVI software tracks all entries, exits and cross over reads. The cross over vehicles are neither entry or exit, but a position indicator. The system automatically generates monthly billing statements for the vehicle owners to change for airport access.

2.1 PERSONNEL AMANAGER LANDSIDE OPERATIONS@

- Personnel Function Oversees functions of the AVI/Parking system.
- Quantity One
- Location MSP Terminal
- Working hours Regular workday
- Status Existing

2.2 PERSONNEL AAPPLIED MANAGEMENT CORPORATION PERSONNEL@

- Personnel Function Install and assists in the maintenance of the AVI/Parking system.
- Quantity One.
- Location MSP terminal.

2.3 PERSONNEL ALANDSIDE OPERATIONS AGENT@

- Personnel Function Administer commercial vehicle accounts.
- Location MSP Terminal.
- Status Existing

3.1 HARDWARE AACTIVE RF TAG@

- Hardware Type Battery powered in-vehicle transmitter/receiver.
- Functions Receives a signal from the AVI transmitters at the parking facility and transmits a unique number.
- Location In each commercial which has a billing account with MSP. These tags are also placed in emergency vehicles
- Data Name/Contents Unique ID number which is set at the factory, but can be requested by the customer (MAC)
- Data Type Data
- Status Existing

3.2 HARDWARE ALOOP DETECTORS@

- Hardware Type In-pavement magnetic induction loop vehicle detectors.
- Functions Indicates presence of a vehicle to the AVI system. At MSP and the taxi dispatch facility, vehicle entry point loops activate the tag reader transceiver and a second loop detects vehicles which have passed by the gate arm indicating that it can safely be closed. Loops are positioned in a similar manner at commercial vehicle exits at both facilities and perform essentially the same functions.
- Location
 - 1) At the MSP commercial vehicle entry and exit points.
 - 2) At the taxi dispatch facility entry and exit points.
- Data Name/Contents Vehicle presence.
- Data Type Data.
- Status Existing.

3.3 HARDWARE ATAG READ ANTENNA@

- Hardware Type Directional RF antenna.
- Functions Transmit/receive data.
- Location Mounted in overhead positions at:
At the MSP commercial vehicle entry and exit points.
At the taxi dispatch facility entry and exit points.
- Data Name/Contents The antenna use two types of data:
Transmits a signal to poll vehicle tags.
Receives a identification number from the polled tags.
- Data Type Data.
- Status Existing.

3.4 HARDWARE ARF TRANSCEIVER@

- Hardware Type Environmentally shielded RF transmitter / receiver.
- Functions Generates/transmits the polling signal to the vehicle tags. Receives the identification number form the polled vehicle tag. Passes the vehicle identification number to the Dynacount parking system controller.
- Location At each of the commercial vehicle entries and exits and at the entry and exit of the taxi dispatch facility.
- Data Name/Contents The transceiver uses three types of data:
 - 1) Transmits a signal to poll vehicle tags.
 - 2) Receives a identification number from the polled tags.
 - 3) Sends a message to the Dynacount Controller to indicate that a vehicle has entered or exited (depending upon location).
- Data Type Data

3.5 HARDWARE ADYNACOUNT CONTROLLER@

- Hardware Type PC with specialized Dynacount software from Traffic and Safety of Detroit, MI.
- Functions Monitors component status (i.e. gate position and open time, alarms for low tickets/ticket in chute {MSP entry only} loop detector on time, vehicle back-out). Sends vehicle in/out messages to the Dynapark and AVI system based on component status.
- Location At commercial vehicle entries and exits.
At entry/exit of the taxi dispatch facility
- Data Name/Contents See functions
- Data Type Data
- Status Existing
- Other For additional information see system City of Minneapolis Parking Management System and the addenda to this section.

3.5.1 SOFTWARE ADYNACOUNT@

- Software Type Specialized parking facility management software.
- Functions Detects vehicle entrances and exits and notifies the Dynapark.
- Status Existing

3.6 HARDWARE AGATE ARM@

- Hardware Type Traffic control gate
- Functions Physical barrier to ingress and egress locations. Controlled by card reader controller, ticket dispensers, fee computers and count control system. Can be manually operated.
- Location Commercial vehicle ingress and egress locations
- Data Name/Contents On/off relay
- Data Type N/A
- Status Existing

3.7 HARDWARE ATICKET DISPENSER@

- Hardware Type Peripherals - parking management system
- Functions Records time/date/ticket number and puts information on hole punch ticket for incoming transient commercial vehicles or transient parkers who enter the commercial vehicle area accidentally
- Location Commercial vehicle entrance locations at MSP
- Data Name/Contents Hole punch card
- Data Type Data
- Status Existing

3.8 HARDWARE AENTRY CONTROLLER (ADP)@

- Hardware Type PC with Amtech of Dallas, TX software in firmware
- Functions Receives tag read information from antenna/RF transceiver, looks up tag number, determine valid status, sends output to gate for open, send tag information (read date, time, status, etc) to CDC or CVCC (TCP). Communicates the ID number to the AVI system= CVCC computer
- Location At MSP terminal entries
At taxi dispatch facility entry
- Data Name/Contents Sends tag ID number
- Data Type Data
- Status Existing

3.9 HARDWARE AEXIT CONTROLLER (ADP)@

- Hardware Type PC with Amtech of Dallas, TX software in firmware
- Functions Receives tag read information from antenna/RF transceiver, looks up tag number, determine valid status, sends output to gate for open, send tag information (read date, time, status, etc) to CDC or CVCC (TCP). Communicates the ID number to the AVI system= CVCC computer
- Location At MSP terminal exits
At taxi dispatch facility exit
- Data Name/Contents Sends tag ID number
- Data Type Data
- Status Existing

3.10 HARDWARE ACVCC COMPUTER (MAIN TERMINAL)@

- Hardware Type Pentium PC
- Functions This hardware performs the management functions of the AVI system:
 - 1) Polls all lane controllers for tag read information
 - 2) Records entries/exits from the taxi dispatch
 - 3) Records entries/exits from the MSP Terminal facility
 - 4) Sends and receives information to the CDC for tracking, dispatch and logging purposes.
 - 5) Tracks Adwell time@, the time between a tag read at a MSP entry point and a the same tag read at an exit. Commercial vehicle operators are charged for excessive dwell times.
 - 6) Runs algorithms to queue the appropriate number of taxis both at the MSP terminal and at the taxi dispatch facility.
- Location MSP Terminal
- Data Name/Content Input data is tag ID numbers.
Output is in the form of custom designed reports.
- Data Type Data
- Status Existing

3.10.1 SOFTWARE ADR MULTI USER DOS 5.1@

- Software Type Multitasking operating system.
- Functions Enables CVCC and CDC to perform several tasks simultaneously.
- Status Existing.

3.10.2 SOFTWARE AMAC AVI MANAGEMENT SOFTWARE@

- Software Type Custom written AVI system software created by Metropolitan Airports Commission.

3.10.3 SOFTWARE ANOVELL NETWORK CLIENT SOFTWARE@

- Software Type Network communications software.
- Software Standards Novell NetWare (IPX/SPX).
- Functions Enables communications between computers.
- Status Existing

3.11 HARDWARE ANOVELL FILE SERVER@

- Hardware Type Pentium PC
- Functions Acts as a central repository of AVI system data
- Location MSP Terminal
- Data Name/Contents Records entries/exits from the MSP terminal and the taxi dispatch facility
Data about the specific vehicle is stored on this server (vehicle type, ownership, license plate number)
Data about drivers is stored on this server (name, age, license number, employer)
Information for billing purposes is stored on this server (entries/exits, excessive dwell)
- Data Type Data
- Status Existing

3.11.1 SOFTWARE ANOVELL NETWORK SERVER@

- Software Type Network communications and management software.
- Software Standards Novell NetWare
- Functions Makes centrally stored files available to network client computers
- Status Existing

3.11.2 SOFTWARE AMAC AVI DATABASE MANAGEMENT SOFTWARE@

- Software Type Custom written AVI system software created by Metropolitan Airports Commission.
- Functions Stores all transaction and vehicle/operator account information
- Status Existing

3.12 HARDWARE AFORM PRINTER@

- Hardware Type Dot matrix printer
- Functions Print monthly invoices for commercial vehicle operators (CVO-s)
- Location MSP Terminal
- Data Name/Contents Access charges for CVO-s
- Data Type Hard copy invoices
- Status Existing

3.13 HARDWARE ATAXI DISPATCH QUEUE KIOSK@

- Hardware Type This structure contains a dedicated color serial terminal and keyboard connected to the CVCC
- Functions An attendant in the kiosk can monitor which vehicles (taxi-s) are in the queue waiting for passengers and visually verify that the appropriate vehicles are in the queue in the proper order.
The attendant can also use the terminal to dispatch a special vehicle (i.e. station wagon) at the request of a passenger.
- Location Outside the MSP terminal in the taxi area
- Data Name/Contents Terminal displays fender numbers of the vehicles in the queue at MSP and those queued at the Post Road taxi dispatch facility.
- Data Type Data
- Status Existing

3.14 HARDWARE ACOMMERCIAL VEHICLE ADMINISTRATION WORKSTATION@

- Hardware Type PC
- Functions Allows update/creation of the vehicle/operator/owner database on the file server
- Location MSP terminal
- Data Name/Contents Complete contents of the database were not collected.
For a general overview see HARDWARE 3.11
- Data Type Data
- Status Existing

3.14.1 SOFTWARE ADR MULTI USER DOS 5.1@

- Software Type Multitasking operating system
- Functions Allows CDC and CVCC computers to process several tasks simultaneously
- Status Existing

3.14.2 SOFTWARE ANETWARE CLIENT@

- Software Type Network communications software
- Software Standards IPX/SPX
- Functions Enables computer to communicate with LAN
- Status Existing

3.14.3 SOFTWARE AAVI SOFTWARE@

- Software Type MAC proprietary software
- Functions Access to AVI records on the file server
- Status Existing

3.15 HARDWARE AWAN BRIDGE@

- Hardware Type Bridge to allow LAN-s to communicate at various locations in and around MSP
- Functions Permit access to data stored on the MSP LAN server by remote users and access to remote data by users at MSP
- Location MSP terminal
- Data Type Data
- Status Existing
- Other The exact usage of the hardware was not collected as it is not an integral part of the AVI system

3.16 HARDWARE AFEE WORKSTATION@

- Hardware Type PC
- Functions Processing billing and financial data
- Location MSP terminal
- Data Name/Contents Input of received payments from CVO-s and output of monthly invoices
- Data Type Data
- Status Existing

3.16.1 SOFTWARE ADR MULTI USER DOS 5.1@

- Software Type Multitasking operating system
- Functions Allows CDC and CVCC computers to process several tasks simultaneously
- Status Existing

3.16.2 SOFTWARE ANETWARE CLIENT@

- Software Type Network communications software
- Software Standards IPX/SPX
- Functions Enables computer to communicate with LAN
- Status Existing

3.16.3 SOFTWARE AAVI SOFTWARE@

- Software Type MAC proprietary software
- Functions Access to AVI records on the file server
- Status Existing

3.17 HARDWARE AMSP TERMINAL LAN@

- Hardware Type Ethernet Local Area Network
- Functions Communication and transfer of data between computers and other devices at the MSP terminal
- Location MSP terminal
- Data Name/Contents For data specific to this system, see HARDWARE 3.11
- Data Type Data
- Status Existing

3.18 HARDWARE ACDC COMPUTER (POST ROAD)@

- Hardware Type Pentium PC
- Functions This hardware duplicates the CVCC (HARDWARE 3.10) functions and can operate the major functions of the system in case of a CVCC failure. Additionally the CDC:
 - 1) Sends commands to another PC for video and voice dispatching inside the Superamerica convenience store.
 - 2) Controls the messages on the Dispatching VMS=
- Location Post Road
- Data Name/Contents See Hardware 3.10
- Data Type Data
- Status Existing

3.19 HARDWARE APC FOR DISPATCH MESSAGING@

- Hardware Type PC with internal 16-bit sound card
- Functions Displays Commercial vehicle owner and fender number to indicate that the taxi should enter the release queue
Plays an audible message of the VMS text
- Location Post Road taxi dispatch facility
- Data Name/Contents
 - 1) Vehicle owner and unique fender ID number.
 - 2) Spoken (digitally recorded) versions of the vehicle owner and fender ID number.
- Data Type Data.
- Status Existing.

3.20 HARDWARE ASCAN CONVERTER@

- Hardware Type Electronic video signal format converter.
- Functions Changes the VGA video output of the dispatch Messaging computer to NTSC composite video signals for use by a standard television monitor.
- Location Post Road taxi dispatch facility.
- Data Name/Contents Vehicle owner and unique fender ID number.
- Data Type Data (video).
- Status Existing.

3.21 HARDWARE ATV MONITOR@

- Hardware Type Television set with composite (RCA jack) inputs.
- Functions Display dispatch information to taxi operators.
- Location Post Road taxi dispatch facility.
- Data Name/Contents Vehicle owner and unique fender ID number to move to the release queue.
- Data Type Data (video).
- Status Existing.

3.22 HARDWARE ASPEAKER@

- Hardware Type Audio Speaker.
- Functions Announce dispatch information to taxi operators.
- Location Post Road taxi dispatch facility.
- Data Name/Contents Vehicle owner and unique fender ID number to move to the release queue.
- Data Type Data (audio, digital recording).
- Status Existing.

3.23 HARDWARE ATAXI QUEUE VMS@

- Hardware Type Outdoor Variable Message Sign (five-line).
- Functions Display dispatch information to taxi operators.
- Location Post Road taxi dispatch facility.
- Data Name/Contents Vehicle owner and unique fender ID number to move to the release queue.
- Data Type Text.
- Status Existing.

3.24 HARDWARE ATAXI RELEASE VMS@

- Hardware Type Outdoor Variable Message Sign (five-line).
- Functions Display dispatch information to taxi operators.
- Location Post Road taxi dispatch facility.
- Data Name/Contents Vehicle owner and unique fender ID number to leave the dispatch facility and proceed to the taxi queue at the MSP terminal.
- Data Type Text.
- Status Existing.

4.1 INTERFACE ACTIVE RF TAG

- Connects to ... Card reader antennae
- Interface location At MSP terminal commercial vehicle entrances/exits and at taxi dispatch facility entrances/exits at Post Road
- Interface Type Data
- Interface Direction Both
- Interface Component RF transmission
- Protocol/Standard Proprietary manufacturers-s protocol
- Information Type/Content Tags receive a signal for antennae to transmit ID number; antennae receive ID numbers
- Information Direction Both
- Information Frequency As needed

4.2 INTERFACE LOOP DETECTOR

- Connects to ... Dynapark Computer
- Interface location MSP terminal commercial vehicle entry/exits and at taxi dispatch facility entrances/exits at Post Road
- Interface Type Data
- Interface Direction Both
- Interface Component Wire relay
- Information Type/Content On/off message (vehicle presence)
- Information Direction Both
- Information Frequency Continuous

| | | |
|----------------------------|-----------|--|
| 4.3 | INTERFACE | GATE ARM |
| - Connects to ... | | Dynacount controller |
| - Interface location | | MSP terminal commercial vehicle entry/exits and at taxi dispatch facility entrances/exits at Post Road |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Wire relay |
| - Information Type/Content | | To gate: command to move arm up/down From gate: status of arm up/down |
| - Information Direction | | Both |
| - Information Frequency | | Continuous |
| 4.4 | INTERFACE | TAG READER ANTENNA |
| - Connects to ... | | RF transceivers |
| - Interface location | | MSP terminal commercial vehicle entry/exits and at taxi dispatch facility entrances/exits at Post Road |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Wire lead |
| - Information Type/Content | | Polling signal to cause tags to transmit is sent Tag ID number is received |
| - Information Direction | | Both |
| - Information Frequency | | Polling signal is sent continuously. Tag number is received as needed |

| | | |
|----------------------------|-----------|---|
| 4.5 | INTERFACE | RF TRANSCEIVERS |
| - Connects to ... | | ADP-s at lanes (AMC custom software in CDC) |
| - Interface location | | MSP terminal commercial vehicle entry/exits and at taxi dispatch facility entrances/exits at Post Road |
| - Interface Type | | Data |
| - Interface Direction | | Output |
| - Interface Component | | Serial RS-232 |
| - Information Type/Content | | If a tag is read a signal indicating an entry or exit is sent to the Dynacount controller |
| - Information Direction | | Output |
| - Information Frequency | | As needed |
| 4.6 | INTERFACE | DYNACOUNT CONTROLLERS |
| - Connects to ... | | Loop detectors |
| - Interface location | | MSP terminal commercial vehicle entry/exits |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Copper wire |
| - Information Type/Content | | Message indicating an entry or exit to the MSP terminal It is also possible to send a message back to the Dynacount controller to override the automated entry/exit sequence to prevent gate arms from opening or closing. |
| - Information Direction | | Both |
| - Information Frequency | | As needed |
| 4.7 | INTERFACE | ENTRY/EXIT CONTROLLERS (ADP-s) |
| - Connects to ... | | CVCC Computer |
| - Interface location | | MSP terminal |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Multimode fiber optic cable |
| - Information Type/Content | | ADP-s report entry/exit component status (tag read and ID read) and if an entry /exit has been recorded. |
| - Information Direction | | Both |
| - Information Frequency | | Continuous |

| | | |
|----------------------------|-----------|---|
| 4.8 | INTERFACE | LAN |
| - Connects to ... | | 1) CVCC Computer 2) Fee Workstation 3) WAN Bridge 4) Commercial Vehicle Administration Workstation 5) Form Printer 6) File Server 7) CDC computer |
| - Interface location | | MSP Terminal |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | 10 BaseT Ethernet cable |
| - Information Type/Content | | All hardware components on this system pass their data across this interface. For specific descriptions, see Data Type/Content entries for HARDWARE 3.10 through 3.17 |
| - Information Direction | | Both |
| - Information Frequency | | Continuous |
| 4.9 | INTERFACE | CVCC COMPUTER |
| - Connects to ... | | Taxi dispatch facility Dynacount controllers |
| - Interface location | | MSP Terminal to MSP Post Road taxi dispatch facility |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Multimode fiber optic cable |
| - Information Type/Content | | Messages indicating an entry or exit at the taxi dispatch facility. |
| - Information Direction | | Both |
| - Information Frequency | | As needed |

| | |
|--|---|
| <p>4.10 INTERFACE</p> <ul style="list-style-type: none"> - Connects to ... - Interface location - Interface Type - Interface Direction - Interface Component - Information Type/Content - Information Direction - Information Frequency | <p>CVCC COMPUTER</p> <p>CDC Computer, LAN, Dispatch Kiosk (serial terminal)</p> <p>MSP Terminal to MSP Post Road taxi dispatch facility</p> <p>Data</p> <p>Both</p> <p>Multimode fiber optic cable</p> <p>All system operational (i.e. entry/exit, Kiosk special request data, valid tag ID numbers) data is passed along this connection. The CDC receives this information from the CVCC at the MSP terminal. The CDC sends taxi dispatch-specific , such as message displayed or announced, information to the CVCC. If necessary this interface can be used to control the AVI system using the CDC instead of the CVCC</p> <p>Both</p> <p>Continuous</p> |
| <p>4.11 INTERFACE</p> <ul style="list-style-type: none"> - Connects to ... - Interface location - Interface Type - Interface Direction - Interface Component - Information Type/Content - Information Direction - Information Frequency | <p>CDC COMPUTER</p> <p>PC for Messaging, CVCC for dispatch</p> <p>Post Road taxi dispatch facility</p> <p>Data</p> <p>Both</p> <p>Multimode fiber optic cable</p> <p>Receives tag information from antenna, sends to CVCC via SPX conventional LAN.</p> <p>Command to select a message to display on the television monitor.</p> <p>Command to select a recording to play over the speaker.</p> <p>Output</p> <p>As needed</p> |
| <p>4.12 INTERFACE</p> <ul style="list-style-type: none"> - Connects to ... - Interface location - Interface Type - Interface Direction - Interface Component - Information Type/Content - Information Direction - Information Frequency | <p>PC FOR MESSAGING</p> <p>Speaker</p> <p>Post Road taxi dispatch facility</p> <p>Audio</p> <p>Output</p> <p>Copper wire</p> <p>Prerecorded message which indicates which taxi fender number should move into the release queue</p> <p>Output</p> <p>As needed</p> |

| | | |
|----------------------------|-----------|--|
| 4.13 | INTERFACE | PC FOR MESSAGING |
| - Connects to ... | | VGA to NTSC Scan Converter |
| - Interface location | | Post Road taxi dispatch facility |
| - Interface Type | | Video |
| - Interface Direction | | Output |
| - Interface Component | | VGA cable |
| - Information Type/Content | | Text message which indicates which taxi fender number should move into the release queue |
| - Information Direction | | Output |
| - Information Frequency | | As needed |
| 4.14 | INTERFACE | VGA TO NTSC SCAN CONVERTER |
| - Connects to ... | | TV Monitor |
| - Interface location | | Post Road taxi dispatch facility |
| - Interface Type | | Video |
| - Interface Direction | | Output |
| - Interface Component | | RCA composite video cable |
| - Information Type/Content | | Text message which indicates which taxi fender number should move into the release queue |
| - Information Direction | | Output |
| - Information Frequency | | As needed |
| 4.15 | INTERFACE | CDC COMPUTER |
| - Connects to ... | | TV Monitor |
| - Interface location | | Post Road taxi dispatch facility |
| - Interface Type | | Video |
| - Interface Direction | | Output |
| - Interface Component | | RCA composite video cable |
| - Information Type/Content | | Text message which indicates which taxi fender number should move into the release queue |
| - Information Direction | | Output |
| - Information Frequency | | As needed |

| | | |
|----------------------------|-----------|--|
| 4.16 | INTERFACE | CDC COMPUTER |
| - Connects to ... | | Outdoor variable message signs (VMS) One taxi to release queue sign One taxi release sign |
| - Interface location | | Post Road taxi dispatch facility |
| - Interface Type | | Data |
| - Interface Direction | | Output |
| - Interface Component | | RS-485 |
| - Information Type/Content | | Text message which indicates which taxi fender number should move into the release queue is displayed on the release queue sign Text message which indicates which taxi fender number leave the release queue and proceed to the terminal is displayed on the taxi release sign |
| - Information Direction | | Output |
| - Information Frequency | | As needed |

Supplement - Modified City of Minneapolis Parking Management System - Dynapark
Documentation

3.6 HARDWARE ACOUNT CONTROL SYSTEM COMPUTER@

- Hardware Type Computer
- Functions Runs Dynacount Software (Traffic and Safety)
- Location Parking ramp offices (14 ramps)
- Data Name/Contents Monitors parking system count information and system components status : gates, loops, full signs, alarms(low tickets, ticket in chute, gate open too long, loop detector on too long, back outs)
- Data Type Data
- Status Existing
- Other Intel 386/486 computer-Latest Dos version with Windows

3.6.1 SOFTWARE ADYNACOUNT@

- Software Type Count management software application
- Software Standards Proprietary - Windows-based by Traffic and Safety, Detroit, MI
- Functions Collects, controls, monitors and processes information from system components(gates, loops), activates full sign when appropriate, logs system events and produces reports for ramp manager review.
- Status Existing
- Contact Applied Management Corporation

3.6.2 SOFTWARE ADOS-LATEST VERSION@

- Software Type Operating System
- Software Standards Dos
- Functions
 - 1) Control, PC hardware resources
 - 2) Executes software applications
- Status Existing

3.6.3 SOFTWARE AWINDOWS-LATEST VERSION@

- Software Type Operating System
- Software Standards Windows
- Functions
 - 1) Run applications
 - 2) Provides graphical interface.
 - 3) Controls operating system.
- Status Existing

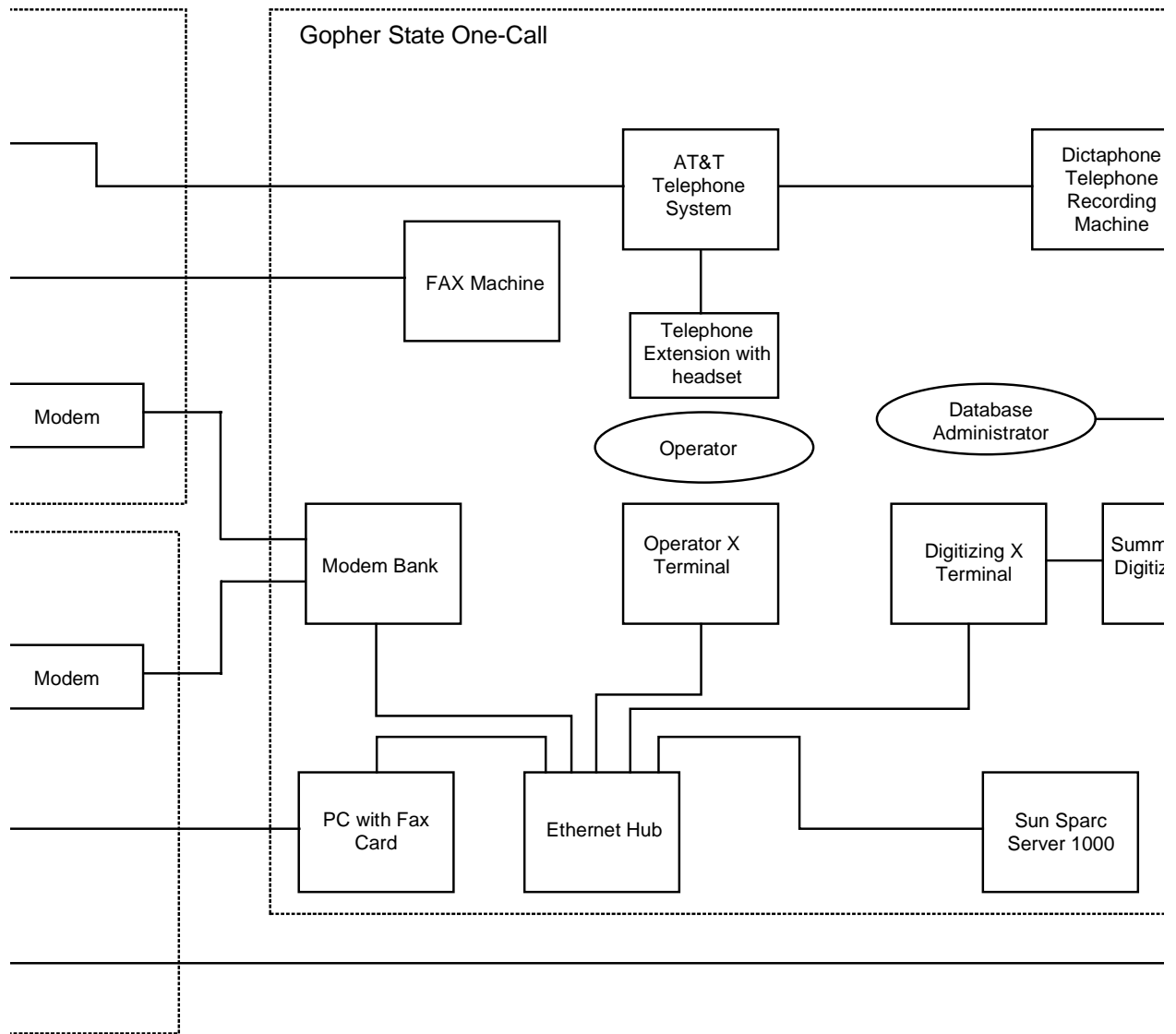
3.7 HARDWARE ACCOUNT CONTROL SYSTEM PRINTER@

- Hardware Type Printer
- Functions Print reports
- Location Parking ramp office
- Data Name/Contents Parking count information, event log (loop status, gate status, low tickets)
- Data Type Data
- Status Existing
- Other Microline 320

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3.8.5 GOPHER STATE ONE-CALL EXCAVATION NOTIFICATION SYSTEM

Baseline Data Collection
-Call Excavation Notification System



AS-IS DATA COLLECTION TEMPLATE

1.0 AGENCY AONE CALL CONCEPTS@

- Agency Type Private corporation
- Agency Functions Operate Aone call@ information collection/ distribution systems. These systems are characterized by a single toll free telephone number which provides access to information from a central source for large geographic areas
- Agency Location(s) 2025 Centre Pointe Boulevard #310
Mendota Heights, MN 55120

2.0 SYSTEM AGOPHER STATE ONE-CALL@

- Date of As-Is Data Collection March 20, 1996
- Purpose Maintain a database of digitized maps showing approximate locations and jurisdictions of underground utilities/facilities.
Collect requests throughout Minnesota for underground facility locations by excavators (48 hours minimum prior to excavating)
Search the database for affected facility operators
Notify facility operators that an excavation is planned
Facility operators are responsible for marking actual location of underground facilities/utilities.
- Hours of Operation 24 hrs/day seven days/week.
- Geographic Coverage Entire state of Minnesota
- Contacts Jennifer Kirk
Director of Education and Public Relations
2025 Centre Pointe Blvd. Suite 310
Mendota Heights, MN 55120
(612) 454-8388 (voice)
- Block Diagram See attached
- Typical Operational Scenario Facility locations are entered into the Gopher State One-Call system by a database administrator who digitizes polygons drawn on maps by individual facility operators. Once digitized, a map is printed and sent back to the facility operators who must check it for accuracy. Any person doing excavation is required by law to contact Gopher State One Call 48 hours (excluding weekends and holidays) prior to beginning work. Contact can take one of three forms:
In the majority of cases, the excavator simply calls Gopher State One Call's toll free number (1-800-252-1166). An operator asks a set of predetermined questions and keys the information into the PRIZM database system.

An excavator who is familiar with the process and information requested during the call may fax their information in. As above, the information is keyed into the PRIZM system manually.

Several of the largest (i.e. NSP, Mn/DOT, communication service providers) users of the One-Call system have PCs with proprietary software written by One-Call Concepts which allows them to key excavation information directly into the system.

The exact information requested is delineated on the attached copy of the Aticket format@

Once excavation location data is entered into the system, a database search is performed to determine which underground facility operators have requested to be notified if excavation is to be performed in that location. The PRIZM system will then automatically fax (or alternately send via modem to a custom PC application) the ticket information to the appropriate facility operators.

After the fax (or other transmission) is sent, Gopher State One-Call has no further interaction with either the facility operator or excavator. Facility operators must mark their own underground facilities they have in the area.

2.1 PERSONNEL AOPERATOR@

- Personnel Function Communicates with excavators to get ticket information
Enters information into the PRIZM system
- Quantity 50 to 60
- Location Gopher State One-Call offices in Mendota Heights.
- Workload This system is the sole responsibility of the operators
- Working hours 24 hrs/day in eight-hour shifts
- Status Existing. More operators are added as necessary.

2.2 PERSONNEL ADATABASE ADMINISTRATOR@

- Personnel Function Digitizes polygons drawn on maps by the facility operators.
- Quantity One
- Location Gopher State One-Call offices in Mendota Heights.

3.1 HARDWARE ATELEPHONE@

- Hardware Type Voice communications telephone
- Functions Communication of ticket information to One-Call operators
- Data Name/Contents See attached example of ticket
- Data Type Voice
- Status Existing

3.2 HARDWARE AFAX MACHINE@

- Hardware Type Document facsimile machine
- Functions Sends ticket information to a fax machine at the One-Call offices in Mendota Heights
- Data Name/Contents See attached example of ticket
- Data Type Data
- Status Existing
- Other This is an alternative form of communication with Gopher State One-Call. It is used primarily by commercial contractors who are familiar with the One-Call system and the information needed

3.3 HARDWARE APERSONAL COMPUTER@

- Hardware Type Intel-based PC
- Functions Runs One-Call software for direct input to the One-Call system
- Data Name/Contents See attached ticket example
- Data Type Data
- Status Existing
- Other This is an alternative form of communication with Gopher State One-Call. It is used primarily by high volume users of the system, such as NSP, Mn/DOT, and US West.

3.4.1 SOFTWARE AGOPHER STATE ONE-CALL DIAL-UP SOFTWARE@

- Software Type Proprietary package which allows a remote PC to communicate with the PRIZM system
- Functions Accepts user input for excavation information
Communicates information to the PRIZM system
- Status Existing

3.4 HARDWARE AMODEM@

- Hardware Type Dial-up serial communications device
- Functions Communications between excavator PC-s and One-Call PRIZM system
- Data Name/Contents See attached ticket example
- Data Type Data
- Status Existing

3.5 HARDWARE AFAX MACHINE@

- Hardware Type Telephone document facsimile machine
- Functions Receives fax documents containing ticket information from excavators
- Location Gopher State One-Call offices in Mendota Heights.
- Data Name/Contents See attached ticket example
- Data Type Data
- Policies Existing

3.6 HARDWARE AAT&T DEFINITY TELEPHONE SYSTEM@

- Hardware Type Multi-line telephone switching and management system
- Functions Receives incoming calls and routes to an available extension
- Location Gopher State One-Call offices in Mendota Heights.
- Data Name/Contents See attached ticket example
- Data Type Voice
- Status Existing

3.7 HARDWARE ADICTAPHONE TELEPHONE RECORDING MACHINE@

- Hardware Type Multi-track audio tape recording machine with telephone system interface
- Functions Records all telephone conversation
- Location Gopher State One-Call offices in Mendota Heights
- Data Name/Contents See attached ticket example
- Data Type Voice
- Status Existing

3.8 HARDWARE ATELEPHONE EXTENSION WITH HEADSET@

- Hardware Type Telephone extension set with a dialing keypad, intercom controls, and a headphone/ microphone combination headset
- Functions Communication with excavators via telephone
Access to the AT&T Definity telephone switcher
- Location Gopher State One-Call offices in Mendota Heights
- Data Name/Contents See attached ticket example
- Data Type Voice
- Status Existing

3.9 HARDWARE AMODEM BANK@

- Hardware Type Cabinet containing approximately 15 modems
- Functions Receive incoming ticket information from excavators equipped with PC-s and modems
Send fax documents of ticket information to facility operators
- Location Gopher State One-Call offices in Mendota Heights
- Data Name/Contents See attached ticket example
- Data Type Data
- Status Existing

3.10 HARDWARE AOPERATOR X TERMINAL@

- Hardware Type Diskless UNIX X-windows Terminal
- Functions Accepts operator input from the excavator
Displays maps of selected area (anywhere in Minnesota) and allows operators to draw polygons of the excavation area.
- Location Gopher State One-Call offices in Mendota Heights
- Data Name/Contents This hardware accepts operator input of ticket information. Terminal can also display maps of the excavation area described by the caller and overlay Township/Range grids to help Identify locations if necessary.
- Data Type Data
- Status Existing

3.10.1 SOFTWARE APRIZM@

- Software Type This is a proprietary Database/GIS package created by One-Call Concepts
- Functions On these workstations, the software displays data entry forms for the operator to fill in with the appropriate data. Also, the software will display a map of an excavation area, on which the operator can draw a polygon to indicate the spatial limits of a database search.
- Status Existing

3.11 HARDWARE ADIGITIZING X WINDOWS TERMINAL@

- Hardware Type Diskless X Windows terminal
- Functions Database Administrator uses this terminal to digitize polygons drawn on maps by the underground facilities operators to indicate locations of their facilities.
- Location Gopher State One-Call offices in Mendota Heights
- Data Name/Contents Spatial data showing approximate locations of underground facilities
- Data Type Data
- Other Gopher State One-Call does not maintain data of exact positions of facilities. One-Call requests only that facility operators indicate areas where they would like notification if excavation occurs. One-Call does not maintain data of the type or exact location of any underground facility.

3.11.1 SOFTWARE APRIZM@

- Software Type This is a proprietary Database/GIS package created by One-Call Concepts
- Functions On this workstation, the PRIZM software accepts coordinate data from digitizing hardware
Allows coordinate registration and performs projection transformations to align facility operator provided data with the spatial data in One-Call-s database
- Status Existing

3.12 HARDWARE ADIGITIZING TABLE@

- Hardware Type Summagraphics Microgrid III digitizing table with corded cursor
- Functions Input of coordinate data from hard copy sources (maps in this case).
- Location Gopher State One-Call offices in Mendota Heights
- Data Name/Contents Spatial data showing approximate locations of underground facilities
- Data Type Data
- Status Existing

3.13 HARDWARE APC WITH FAX CARD@

- Hardware Type Intel-based PC with internal fax card
- Functions Sends ticket information to facility operator
- Quantity One
- Location Gopher State One-Call offices in Mendota Heights
- Data Name/Contents See attached ticket example
- Data Type Data (fax protocol)
- Status Existing

3.13.1 SOFTWARE AFAX COMMUNICATIONS SOFTWARE@

- Software Type Facsimile rasterizer/communications protocol
- Functions Sends ticket information to facility operators

3.14 HARDWARE AETHERNET HUB@

- Hardware Type Ethernet network hub/concentrator
- Functions Manages movement of data across network
- Location Gopher State One-Call offices in Mendota Heights
- Data Name/Contents All of above
- Data Type Data
- Status Existing

3.15 HARDWARE ANETWORK APPLICATION SERVER@

- Hardware Type Sun Sparc Server 1000
- Functions Acts as application server for the PRIZM system software.
- Quantity One
- Location Gopher State One-Call offices in Mendota Heights
- Data Name/Contents All ticket and spatial data for the system resides here.
- Data Type Data
- Recommended Improvements Will be replaced by Sun Microsystems model Sparc Server 1000E
- Status Existing

3.15.1 SOFTWARE AUNIX (UNKNOWN VARIANT, PROBABLY SUN OS)@

- Software Type Operating system/network OS
- Functions Provides network software connectivity between server and X Windows terminals
Manages application server functions
- Status Existing

3.15.2 SOFTWARE APRIZM@

- Software Type This is a proprietary Database/GIS package created by One-Call Concepts
- Functions \$ On the server, this software stores the databases that must be searched to determine which facility operators must be notified of excavation
\$ It is not clear if database functions are hosted by this machine or if they are performed locally at the workstation.
- Status Existing

3.16 HARDWARE APC TERMINAL@

- Hardware Type Intel based personal computer
- Functions Receives Ticket information from Gopher State One-Call
- Location Facility operator-s offices
- Data Name/Contents See attached ticket example
- Data Type Data
- Status Existing

3.16.1 SOFTWARE APRIZM RECEIVER@

- Software Type This is a proprietary remote access package created by One-Call Concepts
- Functions Receives ticket data from the One-Call modem bank
Displays data to the facility operators
- Status Existing

3.17 HARDWARE AMODEM@

- Hardware Type Dial-up serial communications device
- Functions Receives information from the One-Call modem bank
Can also be used to submit tickets when a facility operator also needs to excavate
- Location Facility operator=s offices
- Data Name/Contents See attached ticket example
- Data Type Data
- Status Existing

3.18 HARDWARE AFAX MACHINE@

- Hardware Type Stand-alone telephone-based document facsimile machine
- Functions Sends ticket information to facility operator
- Location Facility operator=s offices
- Data Name/Contents See attached ticket example
- Data Type Data (fax protocol)
- Status Existing

3.19 HARDWARE APAPER MAP@

- Hardware Type Any paper map, with any scale or projection
- Functions The areas in which the facility operator desires notification if excavation occurs are drawn onto paper maps and sent to Gopher State One-Call for digitizing.
- Quantity As many as needed
- Data Name/Contents Polygons representing the areas of interest for facility operators.
- Data Type Graphic hard-copy
- Status Existing

4.1 INTERFACE EXCAVATOR TELEPHONE

- Connects to ... Gopher State One-Call AT&T Telephone System
- Interface Type Voice
- Interface Direction Both
- Interface Component US West telephone line
- Information Type/Content See attached ticket example
- Information Direction Output
- Information Frequency As needed

| | | |
|----------------------------|-----------|--|
| 4.2 | INTERFACE | EXCAVATOR FAX MACHINE |
| - Connects to ... | | Gopher State One-Call Fax Machine |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | US West telephone line |
| - Information Type/Content | | See attached ticket example |
| - Information Direction | | Output |
| - Information Frequency | | As needed |
| 4.3 | INTERFACE | PC (EXCAVATOR) |
| - Connects to ... | | Modem (excavator) |
| - Interface location | | At excavator-s office |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | RS-232 Serial |
| - Information Type/Content | | See attached ticket example |
| - Information Direction | | Output |
| - Information Frequency | | As needed |
| 4.4 | INTERFACE | MODEM |
| - Connects to ... | | Modem bank |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | US West telephone line |
| - Information Type/Content | | See attached ticket example |
| - Information Direction | | Output |
| - Information Frequency | | As needed |
| 4.5 | INTERFACE | AT&T TELEPHONE SYSTEM |
| - Connects to ... | | Dictaphone Telephone Recording Machine |
| - Interface location | | Gopher State One-Call offices in Mendota Heights |
| - Interface Type | | Voice |
| - Interface Direction | | Output |
| - Interface Component | | Unknown |
| - Information Type/Content | | All telephone communication (generally restricted to ticket information) |
| - Information Direction | | Output |
| - Information Frequency | | Continuous |

4.6 INTERFACE AT&T TELEPHONE SYSTEM

- Connects to ... Telephone Extension with Headset
- Interface location Gopher State One-Call offices in Mendota Heights
- Interface Type Voice
- Interface Direction Both
- Interface Component Unknown, but probably four-wire telephone wire (RJ-14)
- Information Type/Content Ticket data from excavators
- Information Direction Output
- Information Frequency As needed

4.7 INTERFACE ETHERNET HUB

- Connects to ... Operator X Windows Terminal
- Interface location Gopher State One-Call offices in Mendota Heights
- Interface Type Data
- Interface Direction Both
- Interface Component Thinnet ethernet cable
- Information Type/Content Ticket data is received
PRIZM software is sent to workstations
Spatial data and maps are sent to workstations
- Information Direction Both
- Information Frequency Continuous

4.8 INTERFACE ETHERNET HUB

- Connects to ... Digitizing X Windows Terminal
- Interface location Gopher State One-Call offices in Mendota Heights
- Interface Type Data
- Interface Direction Both
- Interface Component Thinnet ethernet cable
- Information Type/Content PRIZM software is sent to the workstations
Coordinate data for facility location is sent through this interface to the server
- Information Direction Both
- Information Frequency Continuous

| | | |
|----------------------------|-----------|--|
| 4.9 | INTERFACE | ETHERNET HUB |
| - Connects to ... | | Sun Sparc Server 1000 |
| - Interface location | | Gopher State One-Call offices in Mendota Heights |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Thinnet ethernet cable |
| - Information Type/Content | | All PRIZM software is stored on this server and sent to the workstations to be run locally All ticket data is sent to the server on this interface Coordinate data for locations of facilities is sent to the server on this interface |
| - Information Direction | | Both |
| - Information Frequency | | Continuous |
| 4.10 | INTERFACE | ETHERNET HUB |
| - Connects to ... | | Modem Bank |
| - Interface location | | Gopher State One-Call offices in Mendota Heights |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Thinnet ethernet cable |
| - Information Type/Content | | Incoming data from excavators using PC terminals to enter ticket data Outgoing ticket data to facility operators with PRIZM terminals at their locations |
| - Information Direction | | Both |
| - Information Frequency | | Continuous |
| 4.11 | INTERFACE | ETHERNET HUB |
| - Connects to ... | | PC with Fax Card |
| - Interface location | | Gopher State One-Call offices in Mendota Heights |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Thinnet ethernet cable |
| - Protocol/Standard | | Ticket data to be faxed to facility operators who do not use PCs with the PRIZM software to receive information |
| - Information Direction | | Both |
| - Information Frequency | | Continuous |

| | | |
|----------------------------|-----------|---|
| 4.12 | INTERFACE | MODEM BANK |
| - Connects to ... | | Modem (facility operator) |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | US West telephone line |
| - Information Type/Content | | Both incoming and outgoing ticket data can use this interface |
| - Information Direction | | Both |
| 4.13 | INTERFACE | MODEM |
| - Connects to ... | | PC |
| - Interface location | | At facility operator |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | RS-232 serial cable |
| - Information Type/Content | | Both incoming and outgoing ticket data can use this interface |
| - Information Direction | | Either input or output |
| - Information Frequency | | As needed |
| 4.14 | INTERFACE | FAX MACHINE (ONE-CALL) |
| - Connects to ... | | Fax machine (facility operator) |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | US West telephone line |
| - Information Type/Content | | Ticket data sent to facility operators for those who do not have a PC to receive data |
| - Information Direction | | Output |
| - Information Frequency | | As needed |
| 4.15 | INTERFACE | PAPER MAP |
| - Connects to ... | | Database Administrator |
| - Interface Type | | Paper hard copy |
| - Interface Direction | | Output |
| - Interface Component | | USPS Mail |
| - Information Type/Content | | Maps showing the areas that facility operators must be notified if excavation occurs within. Areas are shown as polygons. |
| - Information Direction | | Output |
| - Information Frequency | | As needed |

GOPHER STATE ONE-CALL TICKET FORMAT

METRO AREA: 454-0002
IN OR OUT OF MINNESOTA: 800-252-1166

1. Type of call being placed: **TICKET NO.** _____
 Excavation Planning excavation
 Excavation Appointment Surveying
 Emergency
2. Phone number _____ Ext. _____ Caller ID number _____
3. Caller name _____
Company name _____
4. Mailing Address _____
City _____ State _____ Zip _____
5. Alternate contact name _____ Phone _____
Best time to contact _____
6. Work to begin date _____ Time _____
7. Explosives (Y/N) _____
8. R.O.W. (Y/N) _____
9. Duration of excavation _____
10. Type of work _____

11. Work being done for _____
12. County _____ City/Place _____
13. Address _____ Street _____
14. Marking instructions _____

15. Remarks _____

16. Township _____ Range _____ Section _____ Quarter _____
Township _____ Range _____ Section _____ Quarter _____

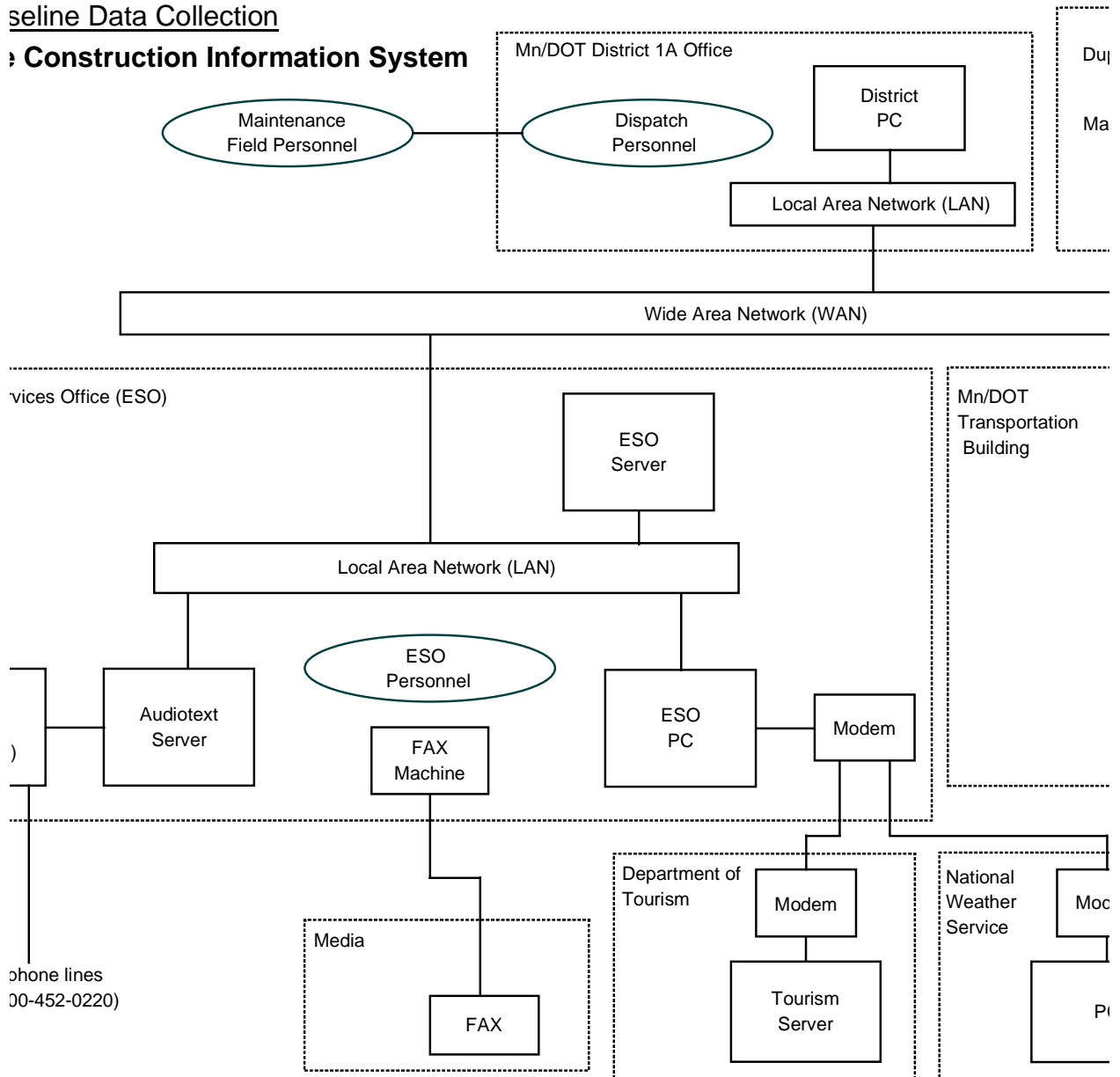
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3.8.6 MN/DOT STATEWIDE CONSTRUCTION INFORMATION SYSTEM

Baseline Data Collection

Construction Information System



AS-IS DATA COLLECTION TEMPLATE

1.0 AGENCY AMN/DOT EMERGENCY SERVICES OFFICE@

- Agency Type Emergency Services Office
- Agency Functions Provide weather and construction information
- Agency Location(s) 100 Stockyards Road
South St. Paul, MN 55075
- Contacts Darrel L. Schierman

2.0 SYSTEM AMN/DOT STATEWIDE CONSTRUCTION INFORMATION@

- Date of As-Is Data Collection 2-12-96
- Purpose Provide statewide construction information to all Mn/DOT Districts and the general public.
- Hours of Operation 7:30 AM to 4:30 PM Weekdays - May 1 to November 1
- Geographic Coverage System covers all interstate, trunk highway and scenic routes in the state.
- Contacts Darrel L. Schierman - Director
Road and Vehicle Information and Service
Mail Stop 415, Room 152
100 Stockyards Road
South St. Paul, MN 55075
612-552-7535 (voice)
612-297-1908 (fax)
612-640-2609 (pager)
- Status Existing
- Recommended Improvements It is hoped that the new road weather information system that is being field tested will be able to be used for construction information.
- Block Diagram See attached
- Typical Operational Scenario
 - 1) The construction field personnel uses either radio or cellular phone communication to the dispatch personnel and reports and construction activities
 - 2) The dispatch personnel writes the information down for entry into the E-mail system.
 - 3) The dispatch personnel uses the office vision E-mail system (PROFS) and inputs the information into a standardized screen. The dispatch personnel then broadcasts the information to the Emergency Services Office (ESO).
 - 4) ESO personnel receive the information from all districts and produce a summary report. The summary report is then broadcast over the PROFS system to all district offices, maintenance facilities and truck centers.
 - 5) Information is put on the audio text server for access by the general public using the telephone.

- 6) The ESO also faxes the summary report to the media.
- 7) The information is also uploaded to the Department of Tourism server and the National Weather Service.

2.1 PERSONNEL ADIRECTOR@

- Personnel Function Oversee operation of road construction information system.
- Quantity 1
- Location Emergency Services Office - Truck center
Mail Stop 415, Room 152
100 Stockyards Road
South St. Paul, MN 55075
- Working Hours Normal business hours
- Status Existing
- Contact Darrel L. Schierman

2.2 PERSONNEL ATECHNICIAN/SUPERVISOR@

- Personnel Function 1) Summarize information from all districts.
2) Input information into the audio text server.
3) Fax information to media.
4) Upload information to the Department of Tourism server and National Weather System computer.
- Quantity 1
- Location Truck Center
- Working Hours Normal business hours
- Status Existing

2.3 PERSONNEL ADISPATCH PERSONNEL@

- Personnel Function Monitor communication with construction and maintenance personnel and enter information into the database.
- Quantity 1
- Location District office dispatch center
- Working Hours 24 hours per day
- Status Existing

2.4 PERSONNEL AMAINTENANCE FIELD PERSONNEL@

- Personnel Function Communicate construction and maintenance information to the dispatch personnel from maintenance vehicle.
- Location In field
- Workload Variable
- Working Hours Variable
- Status Existing

3.1 HARDWARE ADISTRICT PC@

- Hardware Type Personal computer
- Functions (1) Runs office vision (PROFS)
(2) Runs Microsoft Access software
(3) Other office functions
- Location District office dispatch center
- Data Name/Contents Construction information data entered by the dispatch personnel.
Existing system data:
There is a standard screen for data input, the terminology and completeness of information was not always consistent. The information contained in the E-mail generally includes project limits, type of construction, effect on traffic and estimated completion date.
- Data Type Data
- Status Existing
- Other 386 or 486 (if upgraded) PC

3.1.1 SOFTWARE AOFFICE VISION (PROFS)@

- Software Type Data interchange
- Software Standards Electronic mail
- Functions Allows user to send and receive information from any MN/DOT office or facility.
- Status Existing

3.2 HARDWARE AEMERGENCY SERVICES OFFICE (ESO) PC@

- Hardware Type Personal computer
- Functions (1) Runs office vision (PROFS)
(2) Runs Crosstalk for Windows
(3) Other office functions
- Location ESO office
- Data Name/Contents Construction information broadcast on PROFS system.
- Data Type Data
- Status Existing
- Other Compaq 486- 66 MHz

3.2.1 SOFTWARE AOFFICE VISION (PROFS)@

- Software Type Data interchange
- Software Standards Electronic mail
- Functions Allows user to send and receive information from any MN/DOT office or facility.
- Status Existing

3.2.2 SOFTWARE ACROSSTALK FOR WINDOWS@

- Software Type Communications software
- Software Standards Other
- Functions Used to upload map images to the Department of Tourism server.
- Status New

3.3 HARDWARE AAUDIOTEXT SERVER@

- Hardware Type PC
- Functions Stores
- Location ESO office
- Data Name/Contents Audiotext for dial-up phone line service
- Data Type Data
- Status Existing

3.4 HARDWARE ATELEPHONE SYSTEM@

- Hardware Type Telephone audiotext processor and telephone line selector.
- Functions Processes audiotext responses and controls telephone line off-hook, on-hook.
- Location ESO office
- Data Name/Contents Audiotext responses
- Data Type Digitized voice
- Status Existing
- Other Local access number - 296-3076
Toll free access number 1-800-452-0220
 - 1) Touch tone menu
 - 1- North
 - 2- Central
 - 3- South
 - 4- Twin Cities metro area
 - 2) Total of 20 phone lines
 - one is used for administrative purposes
 - five 800 ready lines

3.5 HARDWARE AFAX MACHINE@

- Hardware Type Fax machine
- Functions Sends summary reports to media.
- Location ESO office
- Data Name/Contents Summary pavement conditions and weather information.
- Data Type Data
- Status Existing

3.6 HARDWARE AESO MODEM@

- Hardware Type Modem 28.8 baud
- Functions Uploads information to the Department of Tourism server and the National Weather Service
- Location ESO office
- Data Name/Contents Pavement conditions and weather information
- Data Type Data
- Status Existing

3.7 HARDWARE AESO SERVER@

- Hardware Type PC
- Functions Stores
- Location MN/DOT Transportation Building
- Data Name/Contents All MN/DOT electronic mail
- Data Type Data
- Status Existing

3.8 HARDWARE APROFS SERVER@

- Hardware Type PC
- Functions Database for pavement condition and weather information
- Location MN/DOT Transportation Building
- Data Name/Contents All MN/DOT electronic mail
- Data Type Data
- Status Existing

3.8.1 SOFTWARE APROFS DATABASE@

- Software Type Database
- Software Standards ODBC
- Functions Stores database of pavement condition and weather information..
- Status Existing
- Other Oracles NLM 7.1

3.9 HARDWARE ANATIONAL WEATHER SERVICE MODEM@

- Hardware Type Modem
- Functions Uploads information to the Department of Tourism server and the National Weather Service
- Location ESO office
- Data Name/Contents Pavement conditions and weather information
- Data Type Data
- Status Existing
- Other It was stated in the interview this modem was slow possibly 2400 baud.

3.10 HARDWARE ADEPARTMENT OF TOURISM@

See the documentation for the system: Minnesota Department of Tourism Information Center Kiosks

| | | |
|----------------------------|-----------|--|
| 4.1 | INTERFACE | Maintenance field personnel |
| - Connects to ... | | Dispatch personnel |
| - Interface location | | In field/district office |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Cellular telephone and/or radio |
| - Information Type/Content | | Pavement condition and weather information |
| - Information Direction | | Both |
| - Information Frequency | | As needed |
| 4.2 | INTERFACE | Local area network (LAN) |
| - Connects to ... | | Connect office computers |
| - Interface location | | District office |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Ethernet or token ring |
| - Protocol/Standard | | Novell, TCP/IP, IPX |
| - Information Type/Content | | Pavement condition and weather information |
| - Information Direction | | Both |
| - Information Frequency | | As needed |
| - Information Standards | | See database structure |

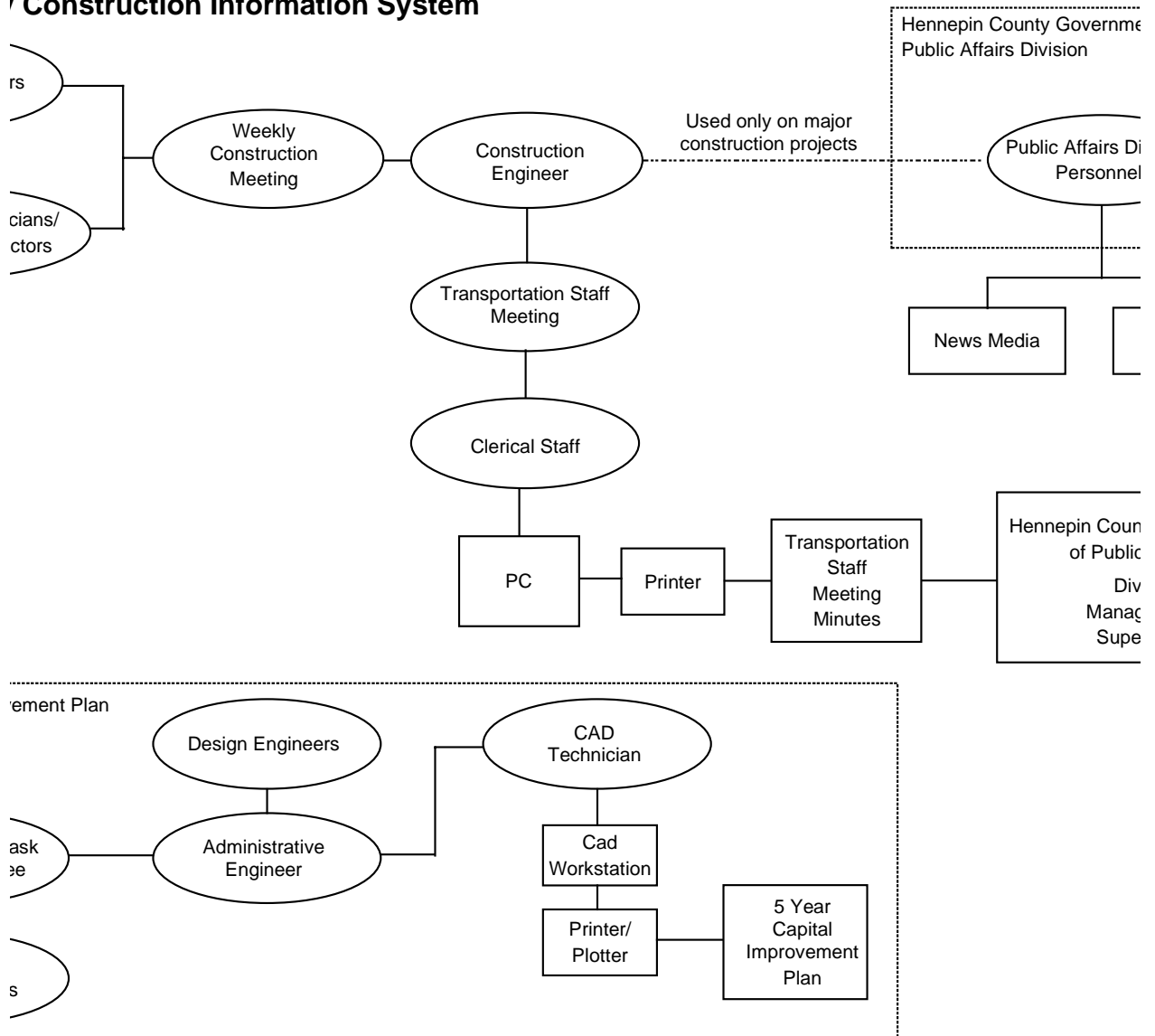
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|----------------------------|-----------|--|
| 4.3 | INTERFACE | Wide area network |
| - Connects to ... | | All Mn/DOT district offices, maintenance facilities and truck centers |
| - Interface location | | Transportation Building in St. Paul |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | T1 phone line (leased continuous operation at 1.544 Megabits per second with 768Kbps dedicated to data transfer at most locations) |
| - Protocol/Standard | | Novell, TCP/IP, IPX |
| - Information Type/Content | | Pavement condition and weather information |
| - Information Direction | | Both |
| - Information Frequency | | As needed |
| - Information Standards | | See database structure |
| 4.4 | INTERFACE | Audiotext server |
| - Connects to ... | | Telephone system |
| - Interface location | | ESO office |
| - Interface Direction | | Both |
| - Information Type/Content | | Audiotext messages |
| - Information Direction | | Output |
| - Information Frequency | | As needed |
| 4.5 | INTERFACE | ESO fax machine |
| - Connects to ... | | Media fax machine |
| - Interface location | | ESO office/Media office |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Service provider |
| - Information Type/Content | | Pavement condition and weather information |
| - Information Direction | | Output |
| - Information Frequency | | As needed |

| | | |
|----------------------------|-----------|--|
| 4.6 | INTERFACE | ESO Modem |
| - Connects to ... | | Department of Tourism modem and National Weather Service modem |
| - Interface location | | ESO office, Department of Tourism and National Weather Service |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Modem via service provider |
| - Information Type/Content | | Pavement condition and weather information |
| - Information Direction | | Output |
| - Information Frequency | | As needed |

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3.8.7 HENNEPIN COUNTY CONSTRUCTION INFORMATION SYSTEM

Baseline Data Collection
 Construction Information System



AS-IS DATA COLLECTION TEMPLATE

1.0 AGENCY AHENNEPIN COUNTY - DEPARTMENT OF PUBLIC WORKS@

- Agency Type County government - Department of Public Works - Transportation Division
- Agency Functions Manage traffic operations, planning, construction and maintenance.
- Agency Location(s) 320 Washington Avenue South
Hopkins, MN 55343

2.0 SYSTEM AHENNEPIN COUNTY CONSTRUCTION INFORMATION SYSTEM@

- Date of As-Is Data Collection 2/20/96
- Purpose
 - 1) Develop 5 year Capital Improvement Plan (CIP).
 - 2) Collect information regarding existing construction projects in Hennepin County and distribute to county division managers and supervisors.
 - 3) Provide information to the county Public Affairs Division on certain construction projects.
- Hours of Operation Not applicable
- Geographic Coverage Hennepin County designated roadways and other construction projects using county funding.
- Contacts Dharam Bobra
320 Washington Avenue South
Hopkins, MN 55343
(612) 930-2537 (voice)
(612) 930-2513 (fax)
- Status Existing
- Constraints There is not enough funding or manpower for any improvement to the existing construction information system. Hennepin County would not be able to contribute funding for an ITS related project.
- Recommended Improvements No improvements were recommended by the interviewee.
- Block Diagram See attached
- Typical Operational Scenario
 - 1) The county develops a 5 year Capital Improvement Plan. A list of construction projects that are planned and an estimate of the construction costs prepared by the design engineer(s) are reviewed by the capital budget task force committee. The committee, with input from the county board commissioners, recommends the projects for the 5 year CIP. A map is produced each year showing the construction projects and year of funding. Construction projects that are not funded in the 5 year Capital Improvement Plan are also shown.
 - 2) The county construction personnel have weekly

meetings for management of projects that are currently under construction. The meetings are attended by the construction engineer, inspectors, engineering technicians and the project engineer. The construction engineer reports the status of the current construction projects at the weekly/biweekly transportation staff meetings. The minutes from the staff meeting are typed by clerical personnel. The meeting notes are distributed to the managers and supervisor in all county divisions.

3) For large construction projects with significant traffic impacts the public affairs division will be used to distribute information concerning the project to the public and news media. This information typically contains a map of the project area, description of the project and right-of-way information.

2.1 PERSONNEL ACONSTRUCTION ENGINEER@

- Personnel Function Oversee all construction projects and report the status of the projects to transportation staff.
- Quantity 1
- Status Existing
- Other There are approximately 45 people working in the construction department as project engineers, construction inspectors, engineering technicians and surveyors.

2.2 PERSONNEL APROJECT ENGINEER@

- Personnel Function Oversee project construction and report status to construction engineer.
- Status Existing

2.3 PERSONNEL AENGINEERING TECHNICIAN / CONSTRUCTION INSPECTOR@

- Personnel Function Oversee project construction and report status to project engineer and/or construction engineer.
- Status Existing

2.4 PERSONNEL APUBLIC RELATIONS PERSONNEL@

- Personnel Function Distribute information on major construction projects to the general public and the news media.
- Location Hennepin County Government Center
300 South 6th Street
Minneapolis MN
- Status Existing
- Other Did not collect any information concerning the size, scale or extent of a construction project that would have involvement from the Public Affairs Division.

2.5 PERSONNEL ACLERICAL STAFF@

- Personnel Function Receives meeting minutes/notes from the transportation division staff meeting and prepares document for inter-office distribution. The notes are sent to all Hennepin County division managers and supervisors.
- Status Existing

2.6 PERSONNEL AADMINISTRATIVE ENGINEER@

- Personnel Function Provides input to the development of the 5 year Capital Improvement Plan. Oversees the creation of the yearly map and other related documents.
- Quantity 1
- Status Existing
- Other The capital budget task force committee, with input from the county board commissioners and design engineers, makes the decision on what projects are selected for the 5 year Capital Improvement Plan.

2.7 PERSONNEL ATECHNICIAN(S)@

- Personnel Function Provides construction and cost information to the administrative engineer for the development of the 5 year Capital Improvement Plan.
- Status Existing

2.8 PERSONNEL ACAPITAL BUDGET TASK FORCE COMMITTEE@

- Personnel Function Recommends construction projects for inclusion in the 5 year Capital Improvement Plan.
- Status Existing

2.9 PERSONNEL ACOUNTY BOARD COMMISSIONERS@

- Personnel Function Provides input to the capital budget task force committee on development of the 5 year Capital Improvement Plan.
- Status Existing

2.10 PERSONNEL ACAD TECHNICIAN@

- Personnel Function Creates map showing project location, type of construction and year of construction for the 5 year Capital Improvement Plan.
- Status Existing

3.1 HARDWARE ACOMPUTER@

- Hardware Type Computer
- Functions Used to create the meeting minutes from the transportation division staff meeting.
- Data Name/Contents Meeting notes which include the status of construction projects in the county.
- Data Type Data
- Status Existing
- Recommended Improvements None

3.2 HARDWARE APRINTER@

- Hardware Type Printer
- Functions Creates hard copy of the weekly/bi-weekly transportation division staff meeting minutes for distribution through the interoffice mail system.
- Data Type Text
- Status Existing

3.3 HARDWARE ACAD WORKSTATION@

- Hardware Type Cad workstation
- Functions Creates a hard copy of the weekly/bi-weekly transportation division staff meeting notes for distribution through interoffice mail.
- Data Type Text
- Status Existing
- Others Map is produced using Ultimap system.

3.4 HARDWARE A PLOTTER@

- Hardware Type Plotter
- Functions Plot map of 5 year Capital Improvement Plan.
- Data Type Text
- Status Existing

4.1 INTERFACE CONSTRUCTION MEETINGS

- Connects to ... Construction engineer, project engineers, engineering technicians and construction inspectors
- Interface location Meeting location
- Interface Type Paper (meeting notes)
- Interface Direction Output
- Interface Component Person to person
- Information Type/Content Construction project status
- Information Direction Output
- Information Frequency Weekly meetings

4.2 INTERFACE TRANSPORTATION STAFF MEETINGS

- Connects to ... Construction Engineer
- Interface location Meeting location
- Interface Type Paper (meeting notes)
- Interface Direction Output
- Interface Component Person to person
- Information Type/Content Construction project status
- Information Direction Output
- Information Frequency Weekly / bi-weekly meetings

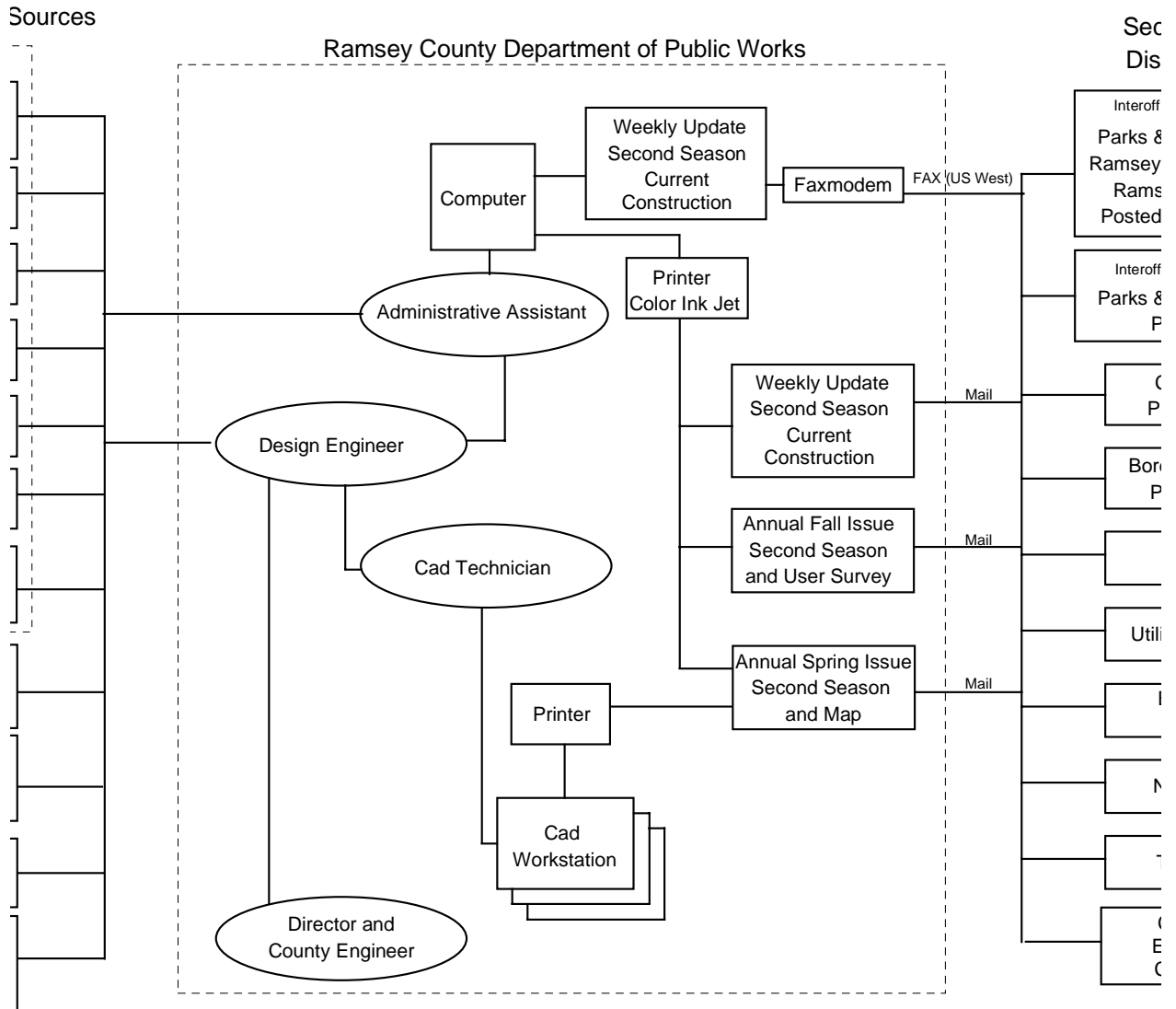
| | | |
|----------------------------|-----------|---|
| 4.3 | INTERFACE | TRANSPORTATION STAFF MEETINGS |
| - Connects to ... | | Clerical staff |
| - Interface location | | Hennepin County Department of Public Works |
| - Interface Type | | Paper (meeting notes) |
| - Interface Direction | | Input |
| - Interface Component | | Hand delivered |
| - Information Type/Content | | Construction project status and meeting notes. |
| - Information Direction | | Input |
| - Information Frequency | | Weekly / bi-weekly |
| 4.4 | INTERFACE | COMPUTER |
| - Connects to ... | | Printer |
| - Interface location | | Hennepin County Department of Public Works |
| - Interface Type | | Data, text hard copy |
| - Interface Direction | | Output |
| - Interface Component | | Parallel cable |
| - Protocol/Standard | | Parallel |
| - Information Type/Content | | Construction project status and meeting notes. |
| - Information Direction | | Output |
| - Information Frequency | | Weekly / bi-weekly |
| 4.5 | INTERFACE | CLERICAL STAFF |
| - Connects to ... | | Hennepin County division managers and supervisors |
| - Interface location | | Hennepin County Department of Public Works |
| - Interface Type | | Text hard copy |
| - Interface Direction | | Output |
| - Interface Component | | Interoffice mail |
| - Information Type/Content | | Construction project status and meeting notes. |
| - Information Direction | | Output |
| - Information Frequency | | Weekly / bi-weekly |

| | |
|--|---|
| <p>4.6 INTERFACE</p> <ul style="list-style-type: none"> - Connects to ... - Interface location - Interface Type - Interface Direction - Interface Component - Protocol/Standard - Information Type/Content - Information Direction - Information Frequency - Other | <p>CONSTRUCTION ENGINEER</p> <p>Hennepin County Public Affairs Division</p> <p>Hennepin County Department of Public Works and Hennepin County Government Center</p> <p>Interoffice mail</p> <p>Output</p> <p>Interoffice mail</p> <p>N/A</p> <p>Project location, map, description of project and right-of- way information.</p> <p>Output</p> <p>As needed</p> <p>Did not collect any information concerning the size, scale or extent of a construction project that would have involvement from the Public Affairs Division.</p> |
| <p>4.7 INTERFACE</p> <ul style="list-style-type: none"> - Connects to ... - Interface location - Interface Direction - Information Type/Content - Information Direction - Information Frequency | <p>ADMINISTRATIVE ENGINEER</p> <p>Design engineer</p> <p>Hennepin County Department of Public Works</p> <p>Input</p> <p>Construction project information and cost estimate.</p> <p>Input</p> <p>As needed</p> |
| <p>4.8 INTERFACE</p> <ul style="list-style-type: none"> - Connects to ... - Interface location - Interface Direction - Information Type/Content - Information Direction - Information Frequency | <p>ADMINISTRATIVE ENGINEER</p> <p>Capital budget task force committee</p> <p>Hennepin County Department of Public Works</p> <p>Both</p> <p>Construction project information and cost estimate.</p> <p>Both</p> <p>As needed</p> |
| <p>4.9 INTERFACE</p> <ul style="list-style-type: none"> - Connects to ... - Interface location - Interface Direction - Information Type/Content - Information Direction - Information Frequency | <p>CAPITAL BUDGET TASK FORCE COMMITTEE</p> <p>County board commissioners</p> <p>Hennepin County Department of Public Works</p> <p>Both</p> <p>Recommendation on 5 year Capital Improvement Plan.</p> <p>Both</p> <p>Unknown</p> |

| | | |
|----------------------------|-----------|--|
| 4.10 | INTERFACE | ADMINISTRATIVE ENGINEER |
| - Connects to ... | | Cad technician |
| - Interface location | | Hennepin County Department of Public Works |
| - Interface Direction | | Both |
| - Information Type/Content | | 5 year Capital Improvement Plan map. |
| - Information Direction | | Output |
| - Information Frequency | | One time per year |
| 4.11 | INTERFACE | CAD WORKSTATION |
| - Connects to ... | | Plotter |
| - Interface location | | Hennepin County Department of Public Works |
| - Interface Type | | Data, county map |
| - Interface Direction | | Output |
| - Interface Component | | Parallel cable |
| - Protocol/Standard | | Parallel |
| - Information Type/Content | | Map showing project location, type of construction and year of construction for the 5 year Capital Improvement Plan. |
| - Information Direction | | Output |
| - Information Frequency | | Once time per year |

3.8.8 RAMSEY COUNTY CONSTRUCTION INFORMATION SYSTEM

Baseline Data Collection
Construction Information System



AS-IS DATA COLLECTION TEMPLATE

1.0 AGENCY ARAMSEY COUNTY - DEPARTMENT OF PUBLIC WORKS@

- Agency Type County Government - Department of Public Works,
Construction Division
- Agency Functions Manage traffic operations, construction and maintenance
operations
- Agency Location(s) 3337 North Rice Street
St. Paul MN 55126
voice (612) 484-9104
fax (612) 482-5232

2.0 SYSTEM ASECOND SEASON PUBLICATION@

- Date of As-Is Data Collection 2/12/96
- Purpose
 - (1) Publish annual beginning of construction season list of all known construction and maintenance projects within the county and a map that shows their location. Information is collected from the spring north metro pre-construction season meeting of all counties, city=s and Mn/DOT.
 - (2) Publish weekly one page summary during the construction season of current projects that upset traffic to an extent equal or greater than a Agawker@ slow down.
 - (3) Publish annual end of construction season listing of projects completed the previous year and the projects approved for construction the following year.
- Hours of Operation Second Season is published weekly during the construction season and covers a six day period from Monday to Saturday.
System updated/used during working hours (7:00 - 4:00).
- Geographic Coverage Ramsey County
- Contacts Larry K. Feldhahn, P.E.
Design Engineer
- Status Existing - Spring of 1996 will be the 6th year of publication.
- Policies
 - 1) Weekly Information must be brief to keep to one page.
 - 2) Traffic impact must be equal to or greater than a Agawkers@ slow down , i.e. drivers slowing down to view the project.
 - 3) Construction duration must be of sufficient length to be published weekly.
- Constraints
 - 1) Because the information is only published weekly, small/short duration and emergency construction projects do not make it in publication.
 - 2) All weekly publications must be kept to one page, at

- the request of most recipients.
- Issues
Not all agencies want/have fax, some have to be mailed. Automatic faxing of multiple page documents not available.
 - Recommended Improvements
 - 1) Want to go to DOS-based networked system to ease flow of data from Design Engineer to Administrative Assistant.
 - 2) Also want to incorporate Second Season into the Ramsey County Internet Web Page.
 - Block Diagram
See attached
 - Other
Washington County (east border of Ramsey County) has a similar publication called *Staying In Touch*
 - Typical Operational Scenario
This occurs when an unforeseen major project with significant traffic impacts is going to be constructed or when a project already included has a greater impact on traffic than previously expected. This has only occurred a few times in the 5 year history of Second Season.
 - 2) Beginning year data is collected from annual north metro pre-construction season meeting and from previous years unfinished projects. Design Engineer types up text and submits to Administrative Assistant who re-types and formats. Hard copies are then made. Map of project locations is drawn on Ramsey Co. base map by Autocad technician and given to Administrative Assistant. Copies of Second Season and map are mailed (United States Postal Service) to all persons on distribution list. Some also receive a fax copy.
 - 3) End of year data is collected by Design Engineer based on beginning year list of projects, updates made to list that include any additional projects, projects not started, completed projects, projects that were not completed and known projects for the following years construction season. This information is given to Administrative Assistant and re-typed/formatted. Copies are then mailed to all persons on distribution list and some also receive a fax copy.

2.1 PERSONNEL ADIRECTOR AND COUNTY ENGINEER@

- Personnel Function County Engineer - Oversees publication of Second Season - Not directly involved with publication of Second Season.
- Quantity 1
- Location Ramsey County Department of Public Works
- Contact Paul L. Kirkwold

2.2 PERSONNEL ADESIGN ENGINEER@

- Personnel Function Construction Inspector - Directly responsible for publication of Second Season, works on Beginning and Ending Second Season publications.
- Quantity 1
- Location Ramsey County Department of Public Works
- Workload 8 hr./day, approximately 4 hr./ week spent on windshield surveys and documentation for weekly Second Season
- Working hours 7:00 am to 4:00 pm
- Status Existing
- Contact Larry K. Feldhahn, P.E.

2.3 PERSONNEL AADMINISTRATIVE ASSISTANT@

- Personnel Function Collect information, type, re-format, distribute Second Season as well as other Clerical Duties.
- Quantity 1
- Location Ramsey County Department of Public Works
- Workload 8 hr./day, approximately 30 min./ week spent on Second Season
- Status Existing
- Contact Peg Mitrovich

3.1 HARDWARE AAUTOCAD WORKSTATION@

- Hardware Type Computer
- Functions Used to create annual beginning construction season project location map.
- Location Ramsey County Department of Public Works
- Data Name/Contents The map has the following information : approximate project limits designated by line on map and project reference number for corresponding text of Second Season
- Data Type The map shows location and reference number for each construction project.
- Status Existing
- Contact Larry K. Feldhahn, P.E.
- Other IBM Compatible PC

3.1.1 SOFTWARE AMS-DOS@

- Software Type Operating System
- Software Standards Dos
- Functions
 - 1) Control, PC hardware resources
 - 2) Executes software applications.
- Status Existing

3.1.2 SOFTWARE AAUTOCAD V12@

- Software Type CAD software application - computer aided design
- Functions Record and display location of construction project information.
- Status Existing

3.1.2 SOFTWARE ALOCAL AREA NETWORK@

- Software Type Network
- Functions Network interface
- Status Existing
- Other Approximately 15-20 Autocad stations connected to existing network.

3.2 HARDWARE ACOMPUTER@

- Hardware Type Computer
- Functions Desktop publishing and faxing weekly publication to distribution list
- Location Ramsey County Department of Public Works
- Data Name/Contents Construction information
- Data Type Data - Construction information: Street being constructed from street to street, type of construction and traffic impacts.
- Status Existing
- Constraints Memory limitation
- Issues May go to PC based system and network
- Contact Peg Mitrovich
- Other Macintosh

3.2.1 SOFTWARE ACANVAS OR PAGEMAKER@

- Software Type Software application - Desktop publishing
- Functions Used to format and print Second Season document
- Status Existing

3.2.2 SOFTWARE AFAX PRO@

- Software Type Communications
- Functions Distribute Second Season via faxmodem to distribution list.
- Status Existing
- Constraints Currently sharing phone line from another office, not a dedicated phone line
- Recommended Improvements Faster faxmodem

3.3 HARDWARE AFAXMODEM@

- Hardware Type Faxmodem (2400 Baud)
- Functions Faxes weekly Second Season to distribution list.
- Location Ramsey County Department of Public Works
- Data Name/Contents Data - Construction information : street being constructed from street to street, type of construction and traffic impacts.
- Data Type Data
- Status Existing
- Constraints The software application only permits single page fax, do not have ability to fax multiple page documents.
- Issues May go to PC based system and network.
- Contact Peg Mitrovich
- Other Zoom faxmodem

4.1 INTERFACE

- Connects to ... Design Engineer
- Interface location External information sources
- Interface Type Meeting location
- Interface Direction Paper (meeting notes)
- Interface Component Both
- Information Type/Content Mn/DOT Annual North Metro Construction Meeting - Includes personnel from Mn/DOT, all municipal entities within County and bordering Counties.
- Information Direction Construction information : Street being constructed from street and street, type of construction and traffic impacts.
- Information Direction Both
- Information Frequency 1 per year
- Other Last year - 1995 construction season was the first time Mn/DOT has held a north metro pre-season construction meeting and there are plans to make this an annual meeting.

| | | |
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| 4.2 | INTERFACE | Design Engineer |
| - Connects to ... | | City of St. Paul |
| - Interface Type | | Voice phone, person to person or fax |
| - Interface Direction | | Both |
| - Interface Component | | Facsimile machine, telephone communication, meetings |
| - Information Type/Content | | Construction information : Street being constructed from street to street, type of construction and traffic impacts. |
| - Information Direction | | Both |
| - Information Frequency | | As needed |
| - Information Standards | | None |
| - Other | | The City of St. Paul and Ramsey County have a close working relationship for sharing construction related information. |
| 4.3 | INTERFACE | Design Engineer |
| - Connects to ... | | Project locations within county |
| - Interface location | | In field |
| - Interface Type | | Visual |
| - Interface Component | | Paper |
| - Information Type/Content | | Visual verification of construction project status and traffic impacts. |
| - Information Frequency | | Inspections done on as-needed basis for projects where there is no other information regarding the status of construction and the affect on traffic. |
| 4.4 | INTERFACE | Design Engineer |
| - Connects to ... | | Ramsey County - Public Works Departments (Construction, Maintenance, Traffic, Environmental and Right of Way) |
| - Interface location | | Ramsey County |
| - Interface Type | | Paper/person to person/phone |
| - Interface Direction | | Both |
| - Interface Component | | Internal mail, phone, meetings |
| - Information Type/Content | | Construction status, project location, type of work, affects on traffic. |
| - Information Direction | | Both |
| - Information Frequency | | As needed |
| - Other | | As with other municipal agencies, all construction work done on County right of way must have a permit, and permit office notifies construction unit or Administrative Assistant directly. |

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| 4.5 | INTERFACE | Administrative Assistant |
| - Connects to ... | | External information sources |
| - Interface location | | Ramsey County |
| - Interface Type | | Paper(changes on previous weeks Second Season), telephone conversations, person to person, fax |
| - Interface Direction | | Input |
| - Interface Component | | Internal mail, phone, fax, person to person |
| - Protocol/Standard | | N/A |
| - Information Type/Content | | Changes for Second Season weekly publication: project location (street names), type of work being done, if project is not a Ramsey County project a telephone number for more information is included. |
| - Information Direction | | Input |
| - Information Frequency | | Once per week |
| - Information Standards | | Street name of construction project, from street to street, type of construction work being done, and affect on traffic. |
| - Constraints | | Project descriptions have to be brief, people receiving information want it to be kept to one page. |
| - Other | | Weekly updates come from only a few external information sources. If the Administrative Assistant has not received updated information, external sources are contacted. |
| 4.6 | INTERFACE | Design Engineer |
| - Connects to ... | | Administrative Assistant |
| - Interface location | | Ramsey County |
| - Interface Type | | Voice, paper |
| - Interface Direction | | Both |
| - Interface Component | | Person to person communications, typed paper |
| - Protocol/Standard | | N/A |
| - Information Type/Content | | Weekly -Street of construction project, from street to street. Type of construction work being done and the affect on traffic. Annual - all information to be included in publication. |
| - Information Direction | | Both |
| - Information Frequency | | Weekly |
| - Other | | Text-based information can be sent to Administrative Assistant via O/A System Text Editor. System is being phased out and replaced with new computers and the network system. |

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| 4.7 | INTERFACE | Design Engineer |
| - Connects to ... | | Autocad Technician |
| - Interface location | | Ramsey County |
| - Interface Type | | Voice, paper |
| - Interface Direction | | Both |
| - Interface Component | | Person to person communications, mock-up of map, previous years map with changes. |
| - Protocol/Standard | | N/A |
| - Information Type/Content | | Project locations and reference number |
| - Information Direction | | Both |
| - Information Frequency | | Once a year |
| - Other | | County base map shows only major roadways (8.5 x11 format) |
| 4.8 | INTERFACE | Autocad PC |
| - Connects to ... | | Printer |
| - Interface location | | Ramsey County |
| - Interface Type | | Data |
| - Interface Direction | | Output |
| - Interface Component | | Parallel Cable |
| - Protocol/Standard | | Parallel |
| - Information Type/Content | | Yearly map of project locations and reference number to be printed (8.5 x11 format) |
| - Information Direction | | Output |
| - Information Frequency | | Once a year |
| - Information Standards | | None |
| - Other | | They keep historical files of map but currently nothing is done with them. |

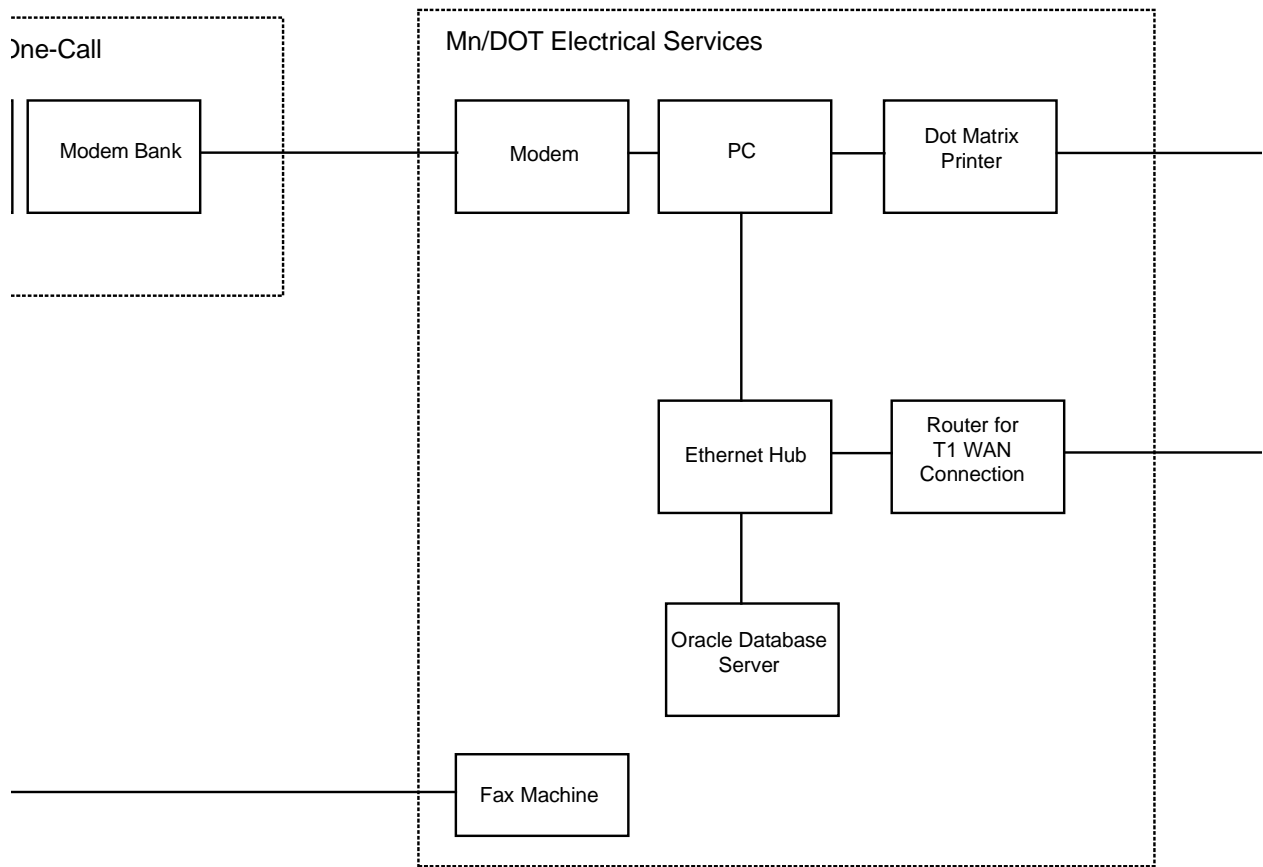
| | | |
|----------------------------|-----------|---|
| 4.9 | INTERFACE | MAC Computer |
| - Connects to ... | | HP Color Jet Printer |
| - Interface location | | Ramsey County |
| - Interface Type | | Data |
| - Interface Direction | | Output |
| - Interface Component | | Printer cable |
| - Information Type/Content | | Weekly Second Season Annual Spring Second Season Annual Fall Second Season and Survey |
| - Information Direction | | Output |
| - Information Frequency | | Weekly |
| - Information Standards | | None |
| - Other | | Have ability to do color maps for Second Season but only the versions posted on bulletin boards are printed in color. |
| 4.10 | INTERFACE | MAC Computer -Faxmodem |
| - Connects to ... | | Distribution list |
| - Interface location | | Ramsey County |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | RS-422 |
| - Information Type/Content | | Weekly Second Season |
| - Information Direction | | Output |
| - Information Frequency | | Weekly |
| - Information Standards | | One page format |
| 4.11 | INTERFACE | Administrative Assistant |
| - Connects to ... | | Ramsey County Department of Public Works |
| - Interface location | | Ramsey County |
| - Interface Type | | Paper |
| - Interface Direction | | Both |
| - Interface Component | | Interoffice Mail |
| - Protocol/Standard | | N/A |
| - Information Type/Content | | Annual and weekly Second Season |
| - Information Direction | | Both |
| - Information Frequency | | Weekly during construction season |

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| 4.12 | INTERFACE | Administrative Assistant |
| - Connects to ... | | Distribution List |
| - Interface location | | Variable |
| - Interface Type | | Paper |
| - Interface Direction | | Both |
| - Interface Component | | United States Postal Service |
| - Protocol/Standard | | N/A |
| - Information Type/Content | | Weekly Second Season - 7 Agencies/customers request that it be mail rather than faxed Spring and Fall Second Season are mailed to all on distribution list. |
| - Information Direction | | Output |
| - Information Frequency | | Weekly during construction season / twice a year |

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3.8.9 MN/DOT ESS GOPHER STATE ONE-CALL ACCESS SYSTEM

Baseline Data Collection
Miner State One-Call Access System



AS-IS DATA COLLECTION TEMPLATE

1.0 AGENCY AMINNESOTA DEPARTMENT OF TRANSPORTATION@

- Agency Type State Department
- Agency Functions Construct, maintain, and administer state transportation facilities.
- Agency Location(s) Headquartered in St. Paul, MN
Electrical Support Services (ESS) Division is located in separate facilities in St. Paul

2.0 SYSTEM AESS GOPHER STATE ONE-CALL ACCESS SYSTEM@

- Date of As-Is Data Collection 2/26/96
- Purpose Notify Mn/DOT ESS personnel that location and marking of an underground facility is required
Store information received from Gopher State One-Call in an Oracle database
- Hours of Operation 24 hrs/day
- Contacts Tom Grimes
Mail Stop 740
6000 Minnehaha Avenue
St. Paul, MN 55111
(612) 725-2305 (voice) (612) 725-2386 (fax)
- Status Existing
- Block Diagram See attached
- Typical Operational Scenario Information is sent via modem from the Gopher State One-Call system to a modem-equipped PC at ESS (for exact contents, see attached example). The PC runs a custom written C program which formats the incoming data and imports it into an Oracle database. The Oracle database runs on a separate computer.
The Right of Way (ROW) indicator flag in the data is checked by software to determine if excavation is in the ROW. If this flag is AY@the information is printed for ESS personnel to review to determine if a crew must be sent to mark the location of any Mn/DOT underground facilities. If a Alocate@is required a crew is dispatched to the site within 48 hours to mark facilities with small flags.
A report is generated by the Oracle database showing which ticket numbers did not require a locate. This report is faxed to Gopher State One-Call. Gopher State One-Call inputs the no locate required tickets into there database to credit Mn/DOT for the no locate required tickets identified within 24 hours.

2.1 PERSONNEL AREVIEWER@

- Personnel Function Examines information received from Gopher State One-Call if it falls within the ROW to determine if a locate is required
- Quantity Two
- Location Mn/DOT ESS offices

2.2 PERSONNEL ATRANSPORTATION ELECTRICAL SUPERINTENDENT@

- Personnel Function
 - 1) Oversees operation of the ESS Gopher State One-Call
 - 2) Access System
 - 3) Reviews system performance
 - 4) Communicates with Gopher State One-Call as necessary
 - 5) Also functions as a reviewer
- Quantity One
- Location Mn/DOT ESS offices

2.3 PERSONNEL AFIELD CREW@

- Personnel Function Mark exact location of underground facilities with colored flags
- Quantity Varies by season (up to 5)
- Location Based at Mn/DOT ESS facility in St. Paul. Responsible for marking facilities in the seven county metro area. Each out state district has one field crew position.

3.1 HARDWARE - AMODEM BANK@

- Hardware Type Cabinet connected to LAN containing approximately 15 modems.
- Functions Send information to Mn/DOT ESS.
- Location Gopher State One-Call offices in Mendota Heights, MN
- Data Name/Contents See attached example
- Data Type Data
- Status Existing

3.2 HARDWARE AMODEM@

- Hardware Type Dial-up serial communications device (9600 bps)
- Functions Receive data from Gopher State One-Call
- Location Mn/DOT ESS offices in St. Paul
- Data Name/Contents See attached example
- Data Type Data
- Status Existing

3.3 HARDWARE APC@

- Hardware Type Intel-based personal computer
- Functions
 - 1) Receives incoming data
 - 2) Processes data using a proprietary C program for import into the Oracle database
 - 3) On screen review of incoming tickets to determine if a locate is necessary
 - 4) Sends reports and work orders for locating crews to the printer
- Location Mn/DOT ESS offices in St. Paul
- Data Name/Contents See attached example
- Data Type Data
- Status Existing

3.3.1 SOFTWARE ADOS@

- Software Type Operating system
- Software Standards 16 Bit DOS

3.3.2 SOFTWARE ADATA CONVERTER@

- Software Type Proprietary program to convert incoming data from Gopher State One-Call
- Functions
 - Receives data
 - Performs conversion functions
 - Formats and enters data in Oracle facility management database
- Application Language C
- Status Existing

3.3.3 SOFTWARE APRIZM@

- Software Type Proprietary software to receive information from Gopher State One-Call
- Functions
 - \$Communicates with Gopher State One-Call modem bank
 - Receives and prints excavation ticket information
- Status Existing

3.4 HARDWARE APRINTER@

- Hardware Type Laser printer (HP Laser Jet)
- Functions
 - 1) Prints ticket information
 - 2) Prints work orders for field crews to mark facilities
 - 3) Prints reports to be faxed to Gopher State One-Call
- Location Mn/DOT ESS offices in St. Paul
- Data Name/Contents Ticket information
Work order (see attached example)
Ticket numbers which required locates
- Data Type Data
- Status Existing

3.5 HARDWARE AETHERNET HUB@

- Hardware Type Network hub/concentrator
- Functions Routes and manages local area network data traffic
- Location Mn/DOT ESS offices in St. Paul
- Data Name/Contents See INTERFACE 4.5 through 4.7 below
- Data Type Data
- Status Existing

3.6 HARDWARE AROUTER FOR T1 WIDE AREA NETWORK (WAN) CONNECTION@

- Hardware Type T1 communications router
- Functions Allows data stored at Mn/DOT ESS offices in St. Paul to be shared with other Mn/DOT offices
- Location Mn/DOT ESS offices in St. Paul
- Data Type Data
- Status Existing
- Other No information was available at the interview time about the specific functions of this hardware

3.7 HARDWARE AORACLE DATABASE SERVER@

- Hardware Type Intel-based microcomputer network server
- Functions Stores ESS facility management database (for complete listing of field in database see attached pages)
Stores received One-Call data
- Location Mn/DOT ESS offices in St. Paul
- Data Name/Contents See attachments
- Data Type Data
- Status Existing

3.7.1 SOFTWARE AORACLE@

- Software Type Database manger
- Functions Stores and queries ESS database
- Status Existing

3.8 HARDWARE AFAX MACHINE@

- Hardware Type Telephone-based document facsimile machine
- Functions Sends reports to Gopher State One-Call
- Location Mn/DOT ESS offices in St. Paul
- Data Name/Contents Report detailing the ticket numbers which did not require a locates.
- Data Type Data
- Status Existing

3.9 HARDWARE AFAX MACHINE@

- Hardware Type Telephone-based document facsimile machine
- Functions Sends reports to Gopher State One-Call
- Location Mn/DOT ESS offices in St. Paul
- Data Name/Contents Report detailing the ticket numbers which did not require a locate.
- Data Type Data
- Status Existing

4.1 INTERFACE GOPHER STATE ONE-CALL MODEM BANK

- Connects to ... Modem
- Interface Type Data
- Interface Direction Both
- Interface Component US West telephone line
- Information Type/Content Excavation ticket information. See System 15.1 Gopher State One-Call
- Information Direction Output
- Information Frequency As needed

| | | |
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| 4.2 | INTERFACE | MODEM |
| - Connects to ... | | PC |
| - Interface location | | Mn/DOT ESS St. Paul facility |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | RS-232 Serial |
| - Information Type/Content | | Excavation ticket information. See System 15.1 Gopher State One-Call |
| - Information Direction | | Output |
| - Information Frequency | | As needed |
| 4.3 | INTERFACE | PC |
| - Connects to ... | | Dot matrix printer |
| - Interface location | | Mn/DOT ESS St. Paul facility |
| - Interface Type | | Data |
| - Interface Direction | | Output |
| - Interface Component | | Parallel cable |
| - Information Type/Content | | Excavation ticket information. See System 15.1 Gopher State One-Call |
| - Information Direction | | Output |
| - Information Frequency | | As needed |
| 4.4 | INTERFACE | DOT MATRIX PRINTER |
| - Connects to ... | | Locating crew |
| - Interface location | | Mn/DOT ESS St. Paul facility |
| - Interface Type | | Hard copy text |
| - Interface Direction | | Output |
| - Interface Component | | Interoffice distribution |
| - Information Type/Content | | Work order for a facility location |
| - Information Direction | | Output |
| - Information Frequency | | As needed |

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| 4.5 | INTERFACE | PC |
| - Connects to ... | | Ethernet Hub |
| - Interface location | | Mn/DOT ESS St. Paul facility |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Twisted pair ethernet cable |
| - Information Type/Content | | Excavation ticket data is sent across this interface to be stored on the Oracle database server. Results of queries performed on the facilities management database are received across this interface |
| - Information Direction | | Both |
| - Information Frequency | | Continuous |
| 4.6 | INTERFACE | ETHERNET HUB |
| - Connects to ... | | Router for T1 WAN connection |
| - Interface location | | Mn/DOT ESS St. Paul facility |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Information Direction | | Both |
| - Information Frequency | | Continuous |
| 4.7 | INTERFACE | ETHERNET HUB |
| - Connects to ... | | Oracle Database Server |
| - Interface location | | Mn/DOT ESS St. Paul facility |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Interface Component | | Twisted pair ethernet cable |
| - Information Type/Content | | Excavation ticket information Facility management database information |
| - Information Direction | | Both |
| - Information Frequency | | Continuous |

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| 4.8 | INTERFACE | ROUTER FOR T1 WAN CONNECTION |
| - Connects to ... | | Mn/DOT WAN |
| - Interface location | | Mn/DOT ESS St. Paul facility |
| - Interface Type | | Data |
| - Interface Direction | | Both |
| - Information Direction | | Both |
| - Information Frequency | | Continuous |
| 4.9 | INTERFACE | FAX MACHINE (MN/DOT ESS FACILITY) |
| - Connects to ... | | FAX MACHINE (GOPHER STATE ONE-CALL) |
| - Interface Type | | Data |
| - Interface Component | | US West telephone line |
| - Information Type/Content | | Reports detailing which ticket numbers required locates and which did not. |
| - Information Direction | | Output |

APPENDIX A

As-Is Agency Reports
Pre-Survey Candidate Systems List

PRE-SURVEY CANDIDATE SYSTEMS

Traffic Signal Control Systems

- City of St. Paul Computran traffic signal control system
- City of St. Paul traffic signal intersection hardware (field equipment)
- City of Minneapolis Fortran traffic signal control system
- Mn/DOT Metro Division/District traffic office closed loop traffic signal system(s)
- County closed loop traffic signal systems (Hennepin, Ramsey, etc.)
- City closed loop traffic signal systems
- Video detection/control of signal system (T.H. 65 & 53rd, Lyndale and Franklin Ave)
- Pre-emption of traffic signals for emergency vehicles (EVP)
- Pre-emption of traffic signal at fire stations
- Pre-emption of traffic signals at railroad crossings (20 locations in Metro area)
- Minneapolis AUSCI operational test

Freeway Management System

- Mn/DOT TMC ramp meter system
- Mn/DOT TMC video surveillance system
- Mn/DOT TMC CMS control system
- KBEM radio broadcast system
- Mn/DOT TMC cable TV information system - (Triple Vision system)
- Mn/DOT Metro Division/District portable changeable message signs
- TMC traffic history database (volume and occupancy data)
- TMC incident log database
- U of M Autoscope incident detection system
- Genesis operational test
- Trilogy operational test
- Mn/DOT workzone traffic management system operational test

Transit Management Systems

- MCTO "Trapeze" scheduling/planning system (creates bus/driver schedules)
- MCTO "radio" system (computer assisted radio system, 7 channels)
- MCTO automatic passenger counters (on some buses)
- MCTO electronic fare collection boxes (on all buses)
- MCTO TIC BusLine system (voice responses system, customer service system)
- MCTO customer service system for route/schedule planning (live telephone operators)
- MCTO transportation section (provides construction information to MCTO)
- MCTO bus stop database (contains the attributes of each bus stop)
- MCTO Police crime/incident tracking system
- MCTO Opticom emitters (EVP on 80 buses)
- MCTO speed light system (ramp meter pre-emption on selected ramps)
- MCTO Route-O-Matic system - vectors around incidents and congestion
- Metropolitan Council Rideshare system (Mn dial-a-ride)
- MCTO funded paratransit systems
- Metropolitan Council Metro Mobility passenger registration system
- Metropolitan Council Metro Mobility passenger reservation system
- U of M transit management
- Southwest Transit
- Minnesota Valley Transit
- Plymouth Metrolink
- School bus dispatch systems

Incident Management Program

- Mn/DOT TMC Highway Helper program (including AVL system)
- Private tow contracts
- U of M police incident management
- St. Paul DIVERT operational test

Electronic Fare Payment Systems

- City of Minneapolis Parking fare collection (smart card)
- City of Minneapolis electronic parking meter maid system
- Smart Darts operational test

PRE-SURVEY CANDIDATE SYSTEMS (CONTINUED)

Electronic Toll Collection Systems

- Toll road proposals (5 proposals in MN)
- Congestion Pricing Study
- Mileage based tax study

Multi modal Traveler Information Systems

- Travlink operational test

Administrative Systems

- Mn/DOT Electrical Services maintenance management system
- Mn/DOT Electrical Service gopher state one-call access system
- Mn/DOT TIS
- Mn/DOT automatic traffic recorder system
- Mn/DOT ISTEPA management systems
- Mn/DOT CVO administrative systems
- DPS CVO administrative systems
- City of Minneapolis sign database

Other Information Systems

- Airline flight arrival/departure information - NW
- Airport rental car kiosk - Hertz
- MN Office of Tourism travel information center kiosks
- Mn/DOT TMC road weather information system access
- Mn/DOT Metro Division weather information access
- Mn/DOT Aeronautics weather information system
- Mn/DOT statewide road weather information telephone information
- Mn/DOT Pavement Condition and Weather Reporting System - future
- Internal distribution system Distribution of TMC loop data via the Internet
- RWIS - Mn/DOT future Road/Weather Information System

Emergency Response Systems

- Motorist call box system
- Mobile Data Terminals (MDT) in all State Patrol cars
- Laptop PC's in State Patrol cars to replace MDT's - pilot project in 1996
- Emergency 911 log system at State Patrol
- State Patrol information desk
- State Patrol South St. Paul information desk
- State Patrol access to drivers license information. via 911 center
- Mn/DOT Mayday operational test
- Demand response dispatch systems - numerous standalone systems

Parking Management Systems

- Metropolitan airports commission parking management
- City of Minneapolis parking management systems
- U of M parking management
- St. Paul Advanced Parking Information System operational test

Miscellaneous

- Mn/DOT portable traffic management system
- City of Minneapolis police special event management
- City of St. Paul special event management
- U of M special event management
- Mn/DOT pilot differential GPS broadcast base station
- Mn/DOT maintenance vehicle AVL
- Mn/DOT Metro Division/District maintenance dispatch
- Hennepin County Medical Center emergency vehicle dispatch
- MN Pollution Control Agency air quality monitoring sites
- Met. Council Forecasting models - uses data from Mn/DOT TIS database
- U of M traffic management system proposal

Interagency Systems

- ICTM - Integrated Corridor Traffic Management System operational test (includes Autoscope)
- ARCTIC - operational test in Virginia, MN

PRE-SURVEY CANDIDATE SYSTEMS (CONTINUED)

CVO Systems

- List of systems from MN Guidestar
- CVO call-in number
- State Patrol toll free Information number

Construction Information/Notification Systems

- Gopher State One Call system for utility locations
- Mn/DOT construction information dissemination
- Counties' systems (Hennepin County)
- Counties' systems (Ramsey County)
- City system (Minneapolis)
- City system (St. Paul)
- Utilities' systems

Communications Systems

- Mn/DOT TMC Fiber optic data communications system
- Mn/DOT Microwave Communication System
- Mn/DOT T1 system
- Mn/DOT Wide Area Network
- MNET (STARS)
- Voice radio - State Patrol, Mn/DOT Maintenance, DNR
- 800 MHZ Trunked Radio system (Metro area)
- Internet Communications
- Traffic Signal Interconnect systems
- RBDS - Radio Broadcast Data Systems
- Mn/DOT Video Conferencing

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APPENDIX B

As-Is Agency Reports Data Collection Guide

APPENDIX C

As-Is Agency Reports
System Documentation Attachments

